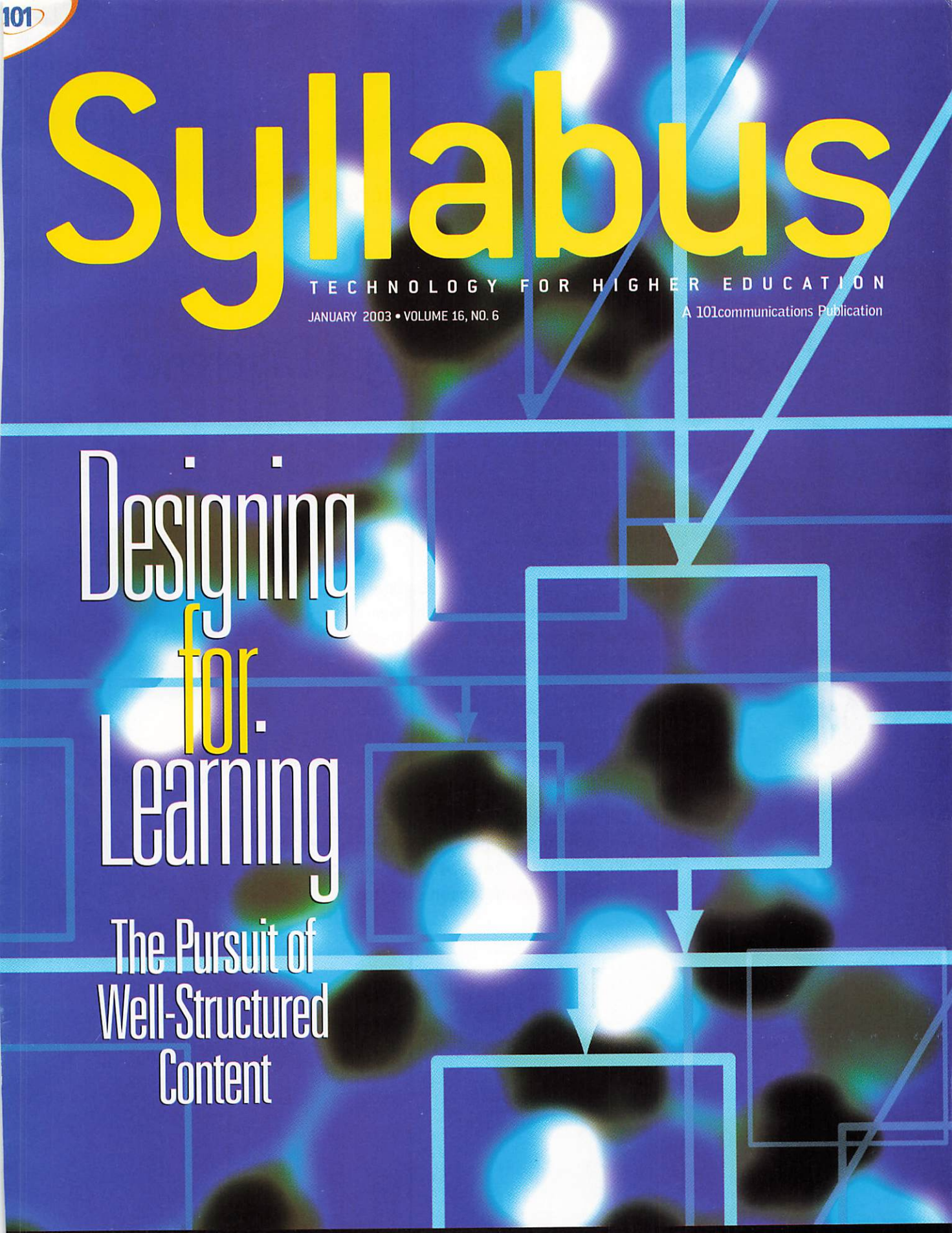
Syllabus

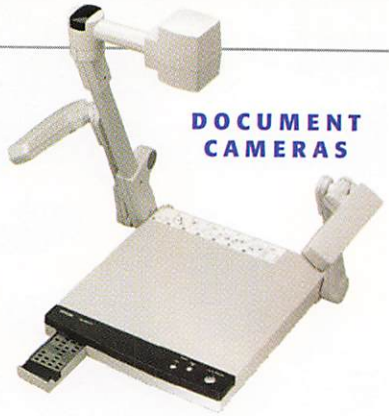
TECHNOLOGY FOR HIGHER EDUCATION
JANUARY 2003 • VOLUME 16, NO. 6
A 101communications Publication



Designing for Learning

The Pursuit of Well-Structured Content

FACULTY DEVELOPMENT • ELECTRONIC GRADING • ACCESSIBLE WEB PAGES



DOCUMENT CAMERAS

PROJECTORS

Epson and You... Making a Difference

WIDE FORMAT PRINTERS

Compatibility. Whether it's in the classroom, computer lab or administration office, EPSON® products are designed to work seamlessly with the equipment you're already using. Plus, many Epson products offer full network support across a wide range of platforms for easy connectivity.

Reliability. Superior engineering and cutting-edge technology ensure our equipment always runs smoothly. From daily classroom use and abuse to the rigors of the "back-office", you can count on Epson products to deliver, every time.

Support. With Epson's world-class service and support, helpful, knowledgeable assistance is always a toll-free call away. We make sure our equipment does its job, so you can do yours.

DESKTOP PRINTERS

For a FREE copy of the *EPSON Digital Technology Solutions Guide for Education* plus a bonus EPSON pen, call us at 1-800-241-5747, VIP Code C2GB* or visit www.info.epson.com/104.

IMPACT PRINTERS

SCANNERS

YOU'VE GOT TO SEE IT IN EPSON COLOR™

EPSON is a registered trademark of Seiko Epson Corporation. ©2003 Epson America, Inc.

**For more information, call 1-800-241-5747, VIP Code C2GB*
or visit www.info.epson.com/104** *Mention VIP Code C2GB when replying

Syllabus
TECHNOLOGY FOR HIGHER EDUCATION

EDITOR Mary Grush
mgrush@syllabus.com
ASSISTANT EDITOR Wendy Gonchar
wgonchar@syllabus.com
CONTRIBUTING EDITOR Paul McCloskey
paul.mccloskey@att.net
COLUMNISTS Phillip D. Long
Sally M. Johnstone
David G. Brown
Steven W. Gilbert
ART DIRECTOR Jeffrey Langkau
ASSOCIATE ART DIRECTOR Susan Morrison
GRAPHIC DESIGNER Allison Cusato
PRODUCTION EDITOR Terri J. Huck
CONTRIBUTORS Judith V. Boettcher
Elaine Garofoli
Nira Herrmann
Jeffrey L. Popyack
Margaret M. Thombs
John Webster
Laura Weidner
Jim Woodell
WRITERS Mary A.C. Fallon
Kelly Murphy
FOUNDER John P. Noon

PUBLISHER Mark Sande
PRODUCTION MANAGER Videssa Djucich
MANUFACTURING & BUSINESS DIRECTOR Carlos Gonzalez
PRODUCTION COORDINATOR Taura Scott
AUDIENCE MARKETING MANAGER Phil Tsang
MARKETING DIRECTOR Kay Heitzman

EDITORIAL OFFICE - SYLLABUS PRESS
101 First Street, #605, Los Altos, CA 94022
Phone: (650) 941-1765
Fax: (650) 941-1785 *(info@syllabus.com)*

SyllabusWeb:
www.syllabus.com

Syllabus E-Newsletter:
http://lists.101com.com/syllabus

WPA Winner Maggie Awards

Syllabus Magazine Advisory Board

CORPORATION FOR RESEARCH AND EDUCATIONAL NETWORKING Judith V. Boettcher
UNIVERSITY OF WASHINGTON Jacqueline Brown
CARNEGIE MELLON UNIVERSITY Robert Cavalier
UNIVERSITY OF WISCONSIN-MADISON Kathy Christoph
UNIVERSITY OF TEXAS-AUSTIN George Culp
DE ANZA COLLEGE William Pritchard

ABP BPA WPA Western Publications Association

EDITOR'S NOTE

Mary Grush, Editor

Instructional design is always a priority for faculty who adopt technology to serve teaching and learning. But are they most concerned with process or content? In "Designing for Learning: The Pursuit of Well-Structured Content" (page 10), Judith Boettcher encourages us to focus on how digital course content can be optimized for the learner. Using technology to provide multi-modal instruction and multiple pathways through the course content should increase learning outcomes.

It is easy for those already using technology in teaching to believe that the demonstration of such positive learning outcomes would help spread the word about technology adoption. But are the models of those who have successfully integrated technology into their teaching enough to influence those who have not? Jim Woodell and Elaine Garofoli take on that question in "Faculty Development and the Diffusion of Innovations" (page 15). They propose a more complex professional development framework with multiple points of entry, allowing for the differing needs and perspectives of faculty.

Assessment strategies are changing as more assignments are being submitted electronically, and feedback to students is often provided in digital form. At Drexel University, instructors have investigated many different methods for marking student work. In "Electronic Grading: When the Tablet is Mightier than the Pen" (page 18), Jeffrey Popyack and Nira Herrmann summarize their findings and consider the drawbacks as well as the benefits of digital markup.

As Web sites become more common for online or Web-supported courses, faculty are becoming aware of the accessibility issues that must be addressed if they are to reach all of their students. But there are excellent resources to help in building the type of Web pages that nearly everyone can use. Margaret Thombs explores these resources in "Accessible Web Pages: Advice for Educators" (page 26). Ideally, technology should eliminate barriers rather than create them—and building for universal access from the ground up is the key.

The Buyer's Guide (page 36) wraps up our examination of instructional design and assessment issues, and highlights a variety of portfolio tools. Don't miss the "Electronic Portfolio Sampler" on page 38.

Have you submitted a proposal to present at Syllabus2003? We've issued one final Call for Papers, running just until January 10, to allow for any last-minute submissions. This year, our annual summer conference will be held at the new Marriott Hotel in downtown San Jose and includes a major event on the campus of Stanford University. Consider submitting a proposal if you haven't already done so. See page 40 for details.

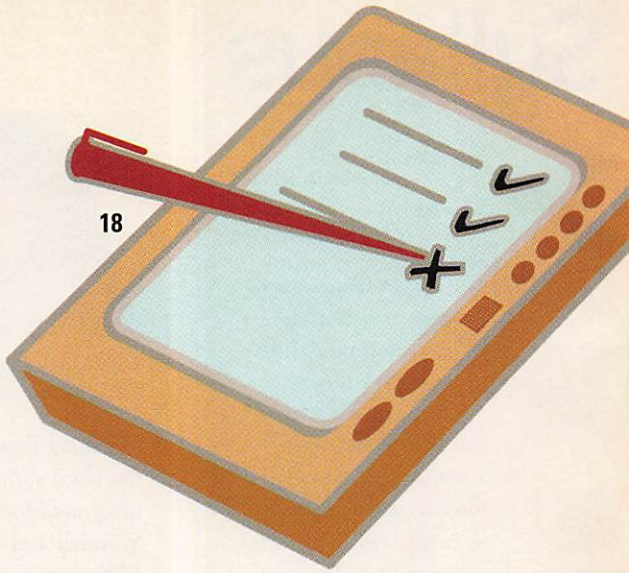
Enjoy this copy of *Syllabus!*

Mary Grush

Letters to the editor should be addressed to the editor and sent to 101 First Street, #605, Los Altos, CA 94022, or via electronic mail. We reserve the right to edit all submissions. **News and product information** will be considered for publication. Please send all materials to Paul McCloskey. If you are interested in writing for *Syllabus*, please send a brief description of your article idea along with writing samples to the editor at the above address.

Syllabus

Vol. 16, No. 6 Syllabus Press



18

CONTENTS JANUARY 2003

FEATURES

10 **Designing for Learning: The Pursuit of Well-Structured Content**

Judith V. Boettcher

Discussions of instructional design often consider technology in terms of processes, or they may emphasize issues of implementation. Here, Judith Boettcher reminds us to step back and look at the significance of content, and she suggests how to select "well-structured content" that will accrue the best advantages from technology and new digital media.

15 **Faculty Development and the Diffusion of Innovations**

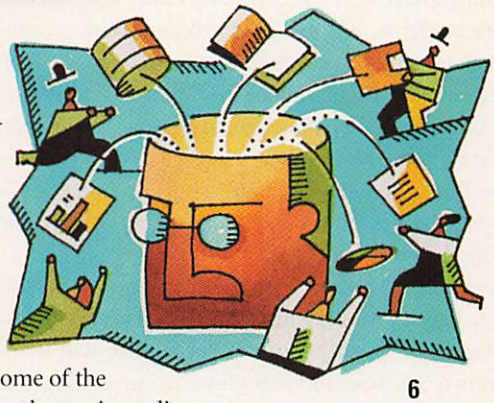
Jim Woodell and Elaine Garofoli

Institutions attempting to establish faculty development can benefit from work done forty years ago by Everett Rogers on the Diffusion of Innovations. Incorporating Rogers's theory and related research, Woodell and Garofoli propose a professional development framework that is sensitive to the differentiated needs of faculty.

18 **Electronic Grading: When the Tablet is Mightier than the Pen**

Jeffrey L. Popyack and Nira Herrmann

Electronic submission of student assignments provides many advantages for faculty and graders, but also presents a variety of challenges. Project DUPLEX (Drexel University Programming Learning Experience) has created a tool that alleviates some of the complexities involved with the electronic grading process.



6

26 **Accessible Web Pages: Advice for Educators**

Margaret M. Thombs

Educators who use the Internet in their instruction or create their own Web pages need to be aware of ADA and other requirements and guidelines regarding universal access to technology. Find out how to ensure the Web pages you're using in your curriculum are accessible to all of your students.

26

COLUMNS

6 Trends

Learning Mangement Systems: Seeking Paradigms for Collaboration

Phillip D. Long

22 Distance Learning

Some Light on the Higher Ed Horizon

Sally M. Johnstone

23 Faculty Practice

An Interactive Community Awaits You

David G. Brown

24 Technology Implementation

Conquering the Support Service Crisis

Steven W. Gilbert

DEPARTMENTS

3 Editor's Note

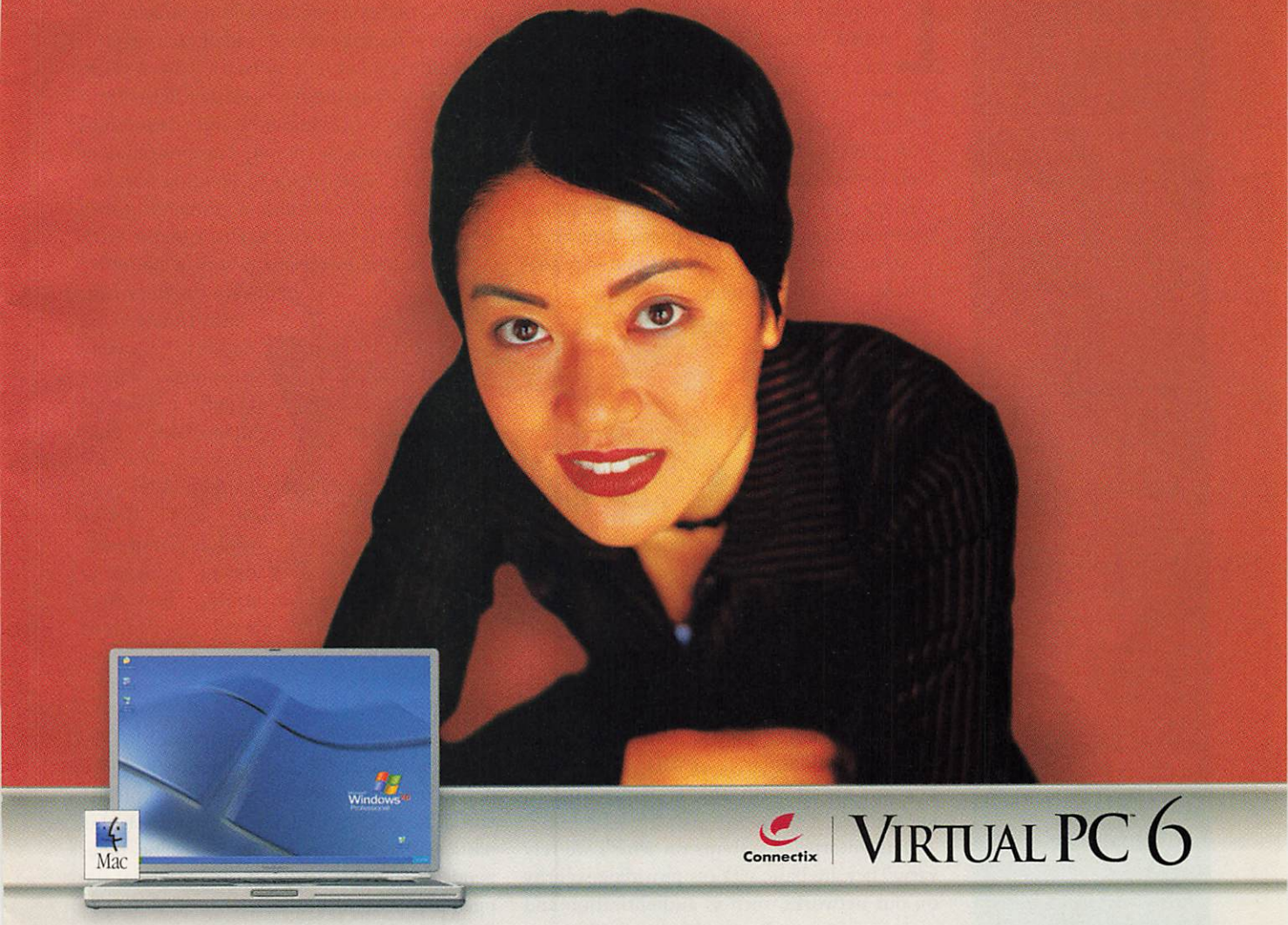
30 Case Studies

36 Buyer's Guide

42 Advertiser Index

SYLLABUS EVENTS Syllabus2003 Tenth Annual Summer Conference - Call for Papers (page 40)

They said
I had to run Windows.
(They never said it had be on a PC.)



Connectix | VIRTUAL PC 6

Yes you can run Windows® on your Mac. And now it's even better.

Connectix Virtual PC™ for Mac - Version 6 gives you the power to run Windows® applications directly from your Mac OS X Dock! Experience improved performance and enhanced integration between Windows and Mac. Whether you're using Mac OS X or Mac OS 9, you can run Windows applications, access PC networks, share files with PC-based colleagues and use PC-only Internet services - all tightly integrated with the Mac interface you know and love. For more details on new features, visit **www.connectix.com/syllabus/**

© 2003 Connectix Corporation. Connectix, the Connectix logo and Connectix Virtual PC are trademarks of Connectix Corporation. Microsoft, Windows are registered trademarks of Microsoft Corporation. All other trademarks are property of their respective holders.

Connectix Virtual PC uses genuine Windows® Operating Systems

Phillip D. Long

Phil Long is senior strategist for the Academic Computing Enterprise at MIT. He is also a senior associate for the TLT Group of the AAHE.
longpd@mindspring.com

TRENDS

AN INFORMATION RESOURCE OF INTEREST TO EDUCATORS

Learning Management Systems: Seeking Paradigms for Collaboration

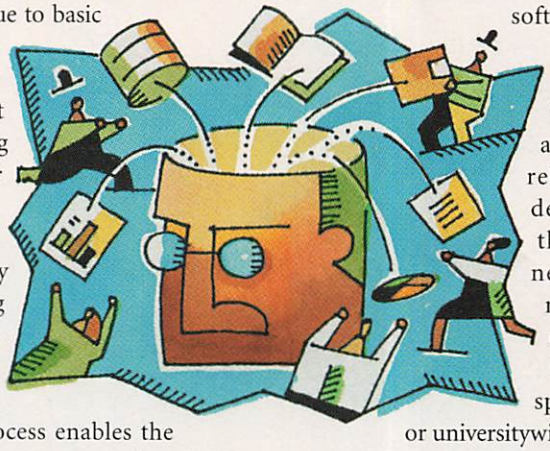
Briefs

- California State University launched a formal **academic technology strategy** to ensure its tech investment is producing the maximum academic return for students, faculty, and voters.
- **Certifications for Microsoft Office XP** have been recommended by the American Council on Education (ACE) for one semester hour of lower division college credit.
- The **University of Louisville** School of Medicine distributed 1,100 Palm Inc. m500 handhelds to students as part of a **strategy to connect students** to patient care throughout its curriculum.
- The University at Buffalo added a 300-node **high-performance computing cluster** to support scientific research projects, including groundwater modeling and computational chemistry.

For these and other news stories, or to subscribe to the weekly Syllabus e-News, Resources, and Trends, visit www.syllabus.com.

Learning Management Systems (LMSes), called Virtual Learning Environments by our European colleagues, are no longer the purview of individual faculty developers. While there are some pioneers who continue to develop flexible learning software as part of their disciplinary work, the tide is definitely turning. Learning Management Systems are becoming enterprise-class software systems.

What is enterprise software? Software that connects and adds value to basic services that are important to your work. The "work" that is central to teaching institutions, whether K-12 or higher education, is learning. Our jobs are fundamentally based on fostering learning among our "clients"—our students. Everything that supports this process enables the primary purpose of our enterprise. At R1 universities, we are simultaneously engaged in knowledge creation, pushing our disciplines beyond the boundaries of what is currently known, along with the transmission of knowledge.



The enterprise systems on which we rely vary. They are basic services providing security on our networks, such as authentication and authorization; or file system services that give applications a common place and mechanism to store information in some common location. Others provide services that tell us who is a member of our class, or what courses a student we advise has taken. Of course, the most basic enterprise software does what is common to the human condition: sending bills to students and parents at the beginning or end of each term.

Building enterprise software is hard work. Most of us buy the fruits of that labor from vendors. We may establish various relationships with our vendors—as one-time purchasers seeking the lowest price to building partnerships. Our vendor-institution partnerships may be limited to implementation teams with vendor involvement and collaborative software development. Unfortunately, the latter rarely happens. That's actually a type of relationship that deserves careful thought. We need new and better models for developing learning tools, be they specific applications or universitywide learning systems.

What Are the Models?

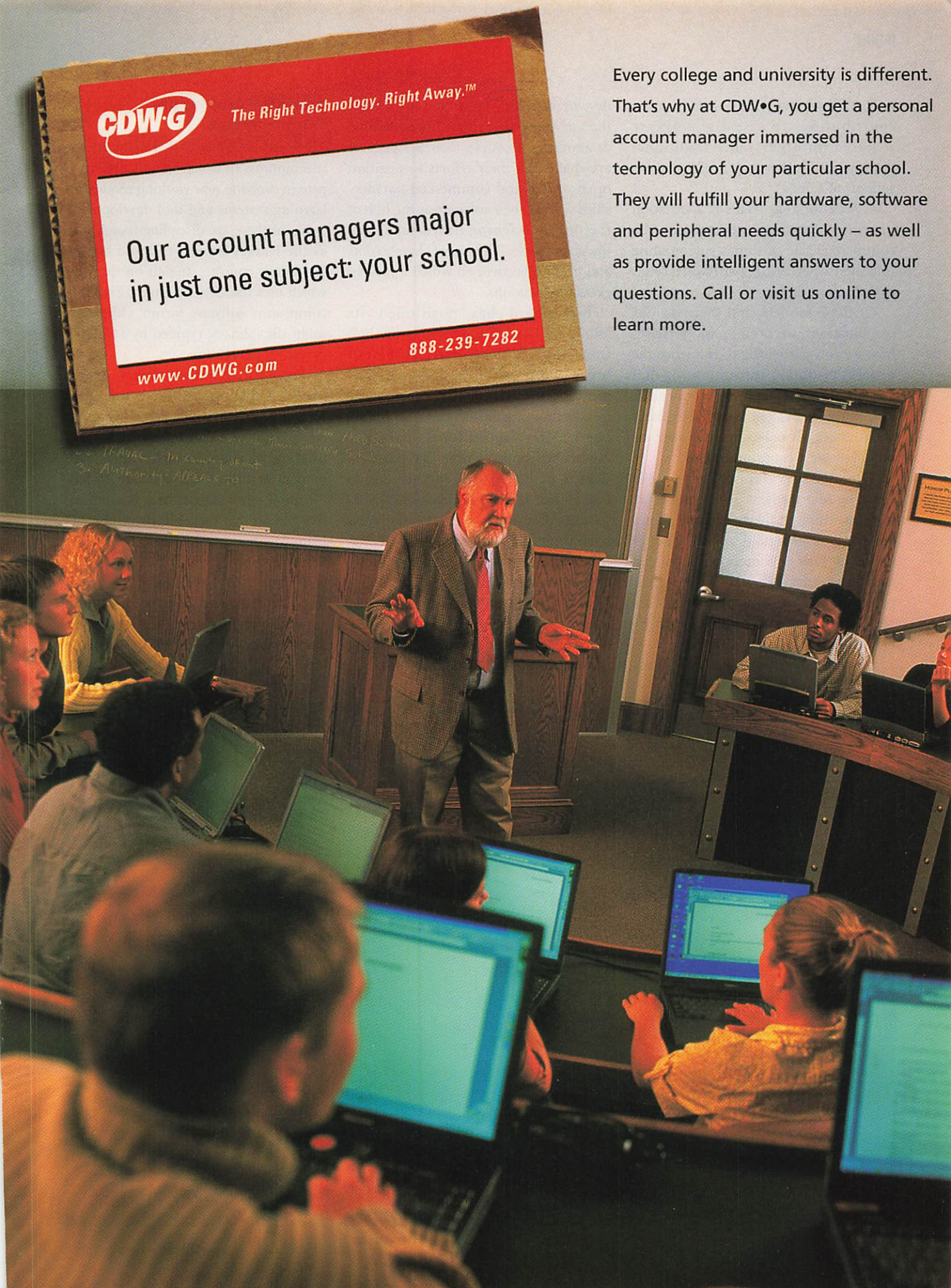
In Eric Raymond's well-known book, *The Cathedral and the Bazaar,* he describes software development as following a traditional hierarchical business model. The alternative in this particular continuum is the freewheeling, independent, modular development process of the open source world, the bazaar.

Translating these archetypes into more recognizable types gives:

1. Support Sellers, otherwise known as, "Give Away the Recipe, Open a Restaurant" (e.g., Red Hat).

2. Loss Leaders—Give away the open source, sell proprietary tools (e.g., Netscape).

Illustrated by Robin Jareaux



Every college and university is different. That's why at CDW•G, you get a personal account manager immersed in the technology of your particular school. They will fulfill your hardware, software and peripheral needs quickly – as well as provide intelligent answers to your questions. Call or visit us online to learn more.

3. Widget Frosting—Invite open contributions to essential software required for other, more traditional commercial sales (e.g., SGI and its support of Samba).

4. Accessorizing—This is a variation of widget frosting, representing the commercial sale of things surrounding installed open source software (e.g., O'Reilly Associates).

Of these models, and their various combinations, we need to ask ourselves how we can participate to influence the process to obtain learning tools that engender better teaching and learning. We also must challenge ourselves to think about what else can be done. Are these the only available avenues open to us?

The vendors remaining in the Learning Management System arena are not just sitting in their cathedrals. They are engaging in various arenas trying to figure out how to address the issues that their users are raising. They are participating in the forums where standards are set, such as the IMS Global Learning Consortium.

Beyond contributing to standards development they are trying to position themselves to be partners in one fashion or another. Of course, their perspectives are shaped by their efforts to position open source and commercial partnerships around their software as the hub of the online learning universe. That's understandable. They have shareholders and profit objectives on which to deliver every three months.

Blackboard has positioned its "Building Blocks" program as the hub from which both commercial "best of breed" tools can be added as well as providing local campus developers a way to add functionality to the core Blackboad LMS. WebCT, for its part, has established both commercial partnerships to facilitate adding specific tools to extend their LMS functionality, as well as sponsored an open source development community hosted off of SourceForge (see www.webct.com/exchange/ViewContent?contentID=2198834).

Leaving things at that, however, would ignore the work going on among many of our colleagues that are shaping possible futures for learning systems.

Shared Knowledge Communities

There are a number of shared knowledge communities in which we can all participate in evolving new working models for learning systems and tool development. Some of these are discipline-based, such as the Harvey Project to build human physiology course materials on the Web, which uses the Generic Object Exchange community software forum. Others are multi-disciplinary, typified by MERLOT (www.MERLOT.org).

The most ambitious of these shared knowledge communities is the Open Knowledge Initiative (http://web.mit.edu/oki), which defines open architectural specifications to support the development of educational software. In fact, the good news is that there is a mutual recognition that these efforts can benefit from greater coordination. OKI, IMS, Schools Interoperability Framework (SIF), and ADL have agreed to coordinate strategy and conduct common activities in this area (see http://imsglobal.org/pressrelease/pr021031.cfm).

continued on page 35

REFERENCES

Open Source Resources

O-LMS, Open-Learning Management System, Tom Malloy, Gary Jensen, and Mary Reddick, www.psych.utah.edu/learn/olms/

Open Source Resources, www.openresources.com/index.html

Free/Libre and Open Source Software: Survey and Study, FLOSS Final Report, International Institute of Infonomics, University of Maastricht, The Netherlands, Berlecon Research GmbH, Berlin, Germany, June 2002, www.infonomics.nl/FLOSS/report/

Open Source Library Systems: Getting Started, 1999, Dan Chudnov, www.oss4lib.org/articles/oss4libarticle.php3

DSpace, http://dspace.org/index.html

Open Archive Initiative, www.openarchives.org/

Models for Software Development

Raymond, Eric (1997): *The Cathedral and the Bazaar,* www.tuxedo.org/~esr/writings/cathedral-bazaar/

Red Hat Inc., www.redhat.com

Netscape, www.netscape.com

SGI and SAMBA, www.sgi.com/software/samba/faq.html

O'Reilly Associates, www.oreilly.com/

Standards Efforts

IMS Global Learning Consortium Inc., http://imsglobal.org

Advanced Distributed Learning (SCORM), www.adlnet.org/

Schools Interoperability Framework (SIF), www.sifinfo.org/

Selected Commercial Learning Management Vendors

Blackboard www.blackboard.com, and in particular the Building Blocks (B2) Program, http://buildingblocks.blackboard.com/bin/index.pl

WebCT, www.webct.com/ and in particular the WebCT Exchange program, www.webct.com/exchange/

Shared Knowledge Communities

Harvey Project, www.harveyproject.org

Generic Object Economy, http://goe.eoe.org/FMPro?-db=null.fp5&-format=goe/GOE_home.htm&-view

MERLOT, www.merlot.org

Open Knowledge Initiative, http://web.mit.edu/oki

EDUCAUSE/National Learning Infrastructure Initiative Virtual Communities of Practice, www.educause.edu/nlii/keythemes/virtualcommunities.asp, and www.educause.edu/vcop/

SONY

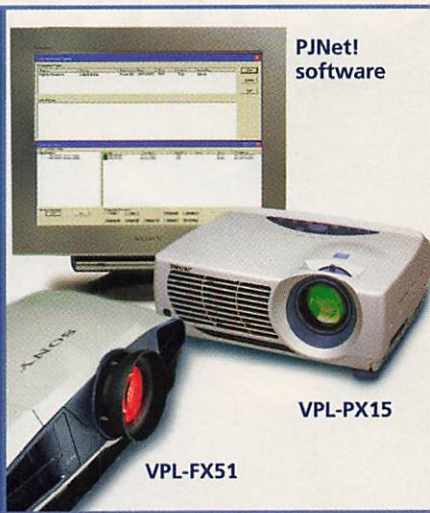
SuperSmart

Head of the Class.

Projectors All Over Campus? You Need A SuperSmart Solution.

A Sony SuperSmart™ Projector, plus powerful Sony PJNet!™ software. Together, they give you a networkable, cross-campus solution for your educational environment. With PJNet! software, you'll have central management and control of Sony networked projectors on campus. Change inputs when there's a problem. Turn off projectors at the end of each day. With remote diagnostics and projector setup to help keep every classroom status go.

With this Sony solution kit, you'll save on lamps, downtime, and unnecessary jogs across campus. SuperSmart Projectors can also store, upload and access files over your LAN. And they integrate easily with other Sony professional products for education and training. Find out more about PJNet! software and Sony's VPL-PX15 and VPL-FX51 projectors – and stay ahead of the class.



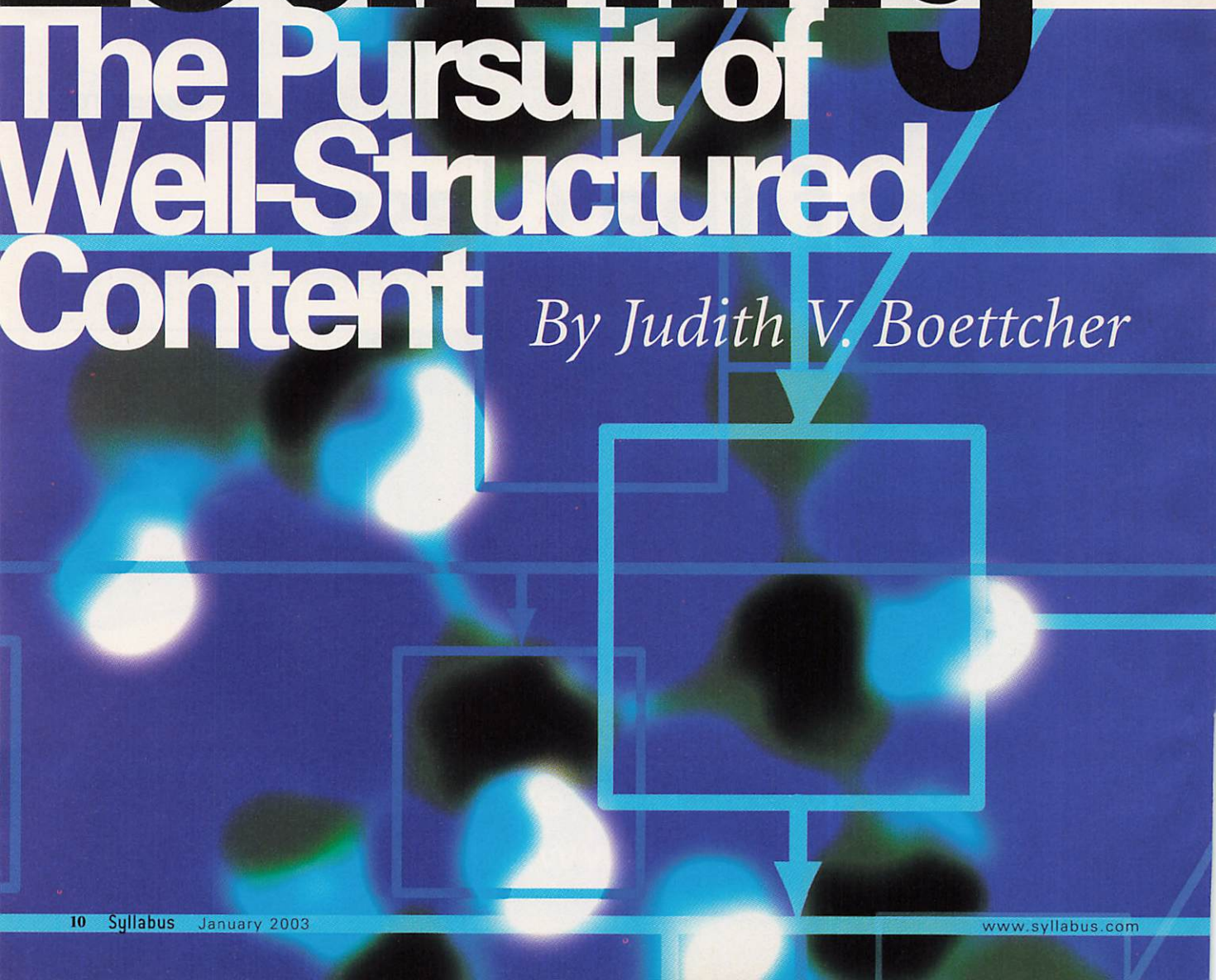
Call us at 1-800-472-SONY, ext. PJNET.
Or visit our website: www.sony.com/pjnet

© 2002 Sony Electronics Inc. All rights reserved. Reproduction in whole or in part without written permission is prohibited. Features and specifications are subject to change without notice. Sony, SuperSmart, and PJNet! are trademarks of Sony.

Designing for Learning

The Pursuit of Well-Structured Content

By Judith V. Boettcher



How do you make course content really accessible to your students? Just as being an expert in your discipline is not by itself a guarantee of good pedagogy, your best-laid technology plans might miss the mark if they are not fine-tuned to the content you wish to present. And the best technology strategies benefit from semantically clear, structured content. Here, Judith Boettcher takes a look at the characteristics of "well-structured content" as it relates to the design of instructional technology resources.

With the emergence of the Web as a new space for instruction, the focus of most analyses of teaching and learning has been on process—overhauling what faculty and students are doing within the learning experience. The organization of what is being taught and its availability in various formats—the structure of the course content—has received much less attention.

Meanwhile, content development has certainly not been neglected. Digital libraries, national content projects such as MERLOT (www.merlot.org), and the work by the W3C on Web accessibility (www.w3.org/WAI/Resources/) are all efforts that foster the evolution of standards and tools for interoperability and easy access to content resources. There is clearly a trend toward further development of knowledge repositories within the disciplines.

But I think it is time now for a renewed emphasis on content resources for learning, along with increased efforts to make course content efficient and effective for students—in other words, well-structured content.

The Meaning of Well-Structured Content

The dictionary definition of the word "structure" is useful. The basic definition of structure is "the result of the action of building or constructing." This definition links well to the currently favored learning theory of constructivism.

A more elaborate definition of structure is "something arranged in a definite pattern of organization." This definition suggests one of the desirable characteristics of well-structured learning content. That is, content for which an organization is clearly visible and in which concepts are presented clearly and precisely.

Course content—the material to be learned or studied—is one of the four core components of the learning experience. The other three are the *teaching*, the *learner*, and the *environmental* components.

Consider the relationship of well-structured content to the design of an online course. Online learning based on well-structured content impacts the identification, selection, and development of course content in three ways:

- Content must be semantically well-structured for instruction; this corresponds to the *teaching* component of the learning experience
- Content must be a good fit or well-structured for a particular student; this corresponds to the *learner* component of the learning experience
- Content must be technologically well structured; this corresponds to the *environmental* component of the learning experience

Note that the meaning of well-structured content goes well beyond the dictionary definitions of structure. It includes the nuances of interaction with the other three components of the learning experience—teaching, learner, and environmental.

Principles of Designing for Learning

Before delving more deeply into the characteristics of well-structured content for digital learning resources, let's review a few basic principles. A core principle of designing for learning is that existing knowledge structures in the brains of faculty and students are different. A student approaching a discipline such as physics, psychology, or biology for the first time will likely have few core

concepts, principles, or facts to build on. At this first approach to a subject, students' thought processes might be compared to the tundra, a bare and cold landscape. The students' brains might have other areas with rich growths, but in the area of physics, their brain space might be called Tundra Territory.

But the discipline knowledge of the physics faculty, at least in the area of physics, might be comparable to jungles—rich, dense growths representing complex structures of knowledge, concepts, principles, applications, and problems. The lectures by physics faculty to the students in large undergraduate courses might be described as "Where the Tundra Brains meet the Jungle Brain."

Research into the differences in the knowledge structures in the minds of students and faculty has a long tradition in cognitive research, studying the distinctions between the knowledge structures and behaviors of novices and the knowledge structures and behaviors of experts. Well-structured content can figuratively warm the landscape of the mind and support the building of foundations for complex knowledge structures.

Multi-Modal Learning Resources

A recognized principle in educational research that works well with the notion of well-structured content and technology use is that efficient learning can be facilitated with sensory input. This includes multimodal experiences, incorporating multiple senses. Fortunately, the current ready availability of multimedia resources makes designing for learning easier than ever.

Well-structured content can make the "jungle" of concepts, rules, and principles more readily learned by students. Multimedia resources, such as animations, simulations, and microworlds encourage student involvement and increase sensory input. Dialoguing online—with other students, with faculty, and with other online resources—also increases sensory inputs.

In addition to being well-structured semantically, content resources ideally fit student goals, readiness, and the individual's current preferred learning environment.

Some students will come to a particular discipline with rich knowledge structures of their own, but still sparse in comparison to the faculty. For faculty, this means identifying and selecting a rich set of resources that may meet the needs of many students. Nishikant Sonwalker (*Syllabus*, November 2001) suggests the selection and identification of many sets of resources, providing multiple paths through a course.

Studying a Subject versus Taking a Course

I was reminded of the importance of content recently when I was chatting with a new college graduate. Her new position involved work with physics materials, so I asked her if she had studied physics in college. She replied quickly and emphatically, "Oh, no, I didn't study physics. I did take a couple of physics courses, but I didn't study physics!"

A curious response! Why would this graduate make a distinction between studying a subject and taking a course? In taking a course, was she describing a learning experience that might have covered content but resulted in few knowledge structures in her memory. And she was well aware of that lack of structure. Might better-structured content have helped to ensure the development of a lasting knowledge of physics?

A student who has successfully earned a grade by "taking the course" might have knowledge structures that were created and linked to each other, but not grounded. These knowledge structures might have been suspended in mid-air, inaccessible after being temporarily constructed for testing purposes. Continuing our climate metaphor, the student essentially created a climate that was temporarily nurturing of isolated knowledge facts, but without integration into other knowledge structures, the learning was lost.

Characteristics of Digital Learning Resources

In designing an online course, a course with online components, or a course that includes digital resources, an instructor makes a host of decisions about the goals and framework, as well as identifying and selecting content. In selecting content, the instructor defines the parameters for the breadth and depth of the course and the expectations of students.

Developing knowledge structures that survive a course and provide transferable knowledge and skills generally requires different types of content. While there are many hierarchies of content types, the simplest paradigm of content has three levels: (1) core concepts and principles, (2) well-structured problems with known solutions and (3) less-structured, complex problems without known solutions. Below are some guidelines for selecting well-structured content and incorporating new digital media resources within these three levels.

Level one: core concepts and principles

At this content level, a faculty designer identifies content that:

- Provides descriptions of core concepts dynamically using visual, audio, and graphic illustrations
- Provides animations that involve the students interacting with the resource and rehearsing processes
- Demonstrates relationships

among core concepts, such as concept maps

- Provides clustering and chunking of information
- Reveals relationships and patterns
- Reveals differentiations and distinctions among concepts
- Links core concept knowledge with current happenings

Level two: well-structured problems with known solutions

At this content level, a faculty designer identifies content that:

- Presents consistent elements of the problem sets to the students
- Reveals patterns inherent to the problems
- Reveals sources and types of knowledge that contribute to problem solutions
- Engages the learner in the solutions, gradually increasing the complexity of the applied rules and principles
- Uses simulations that chunk and cluster the elements of the solutions

Level three: less-structured, complex problems without known solutions

At this content level, a faculty designer identifies content that:

- Provides complex scenarios, such as Harvard case studies
- Engages the learners in solving problems where neither the elements or the solutions are known
- Provides simulations of complex interactions
- Provides real-world problems such as those worked on in engineering and applied disciplines
- Provides opportunities for dialogues with experts on real-life problems
- Uses case studies and problem-based learning

Level three, "less-structured" problems without known solutions maps well to more advanced students, who can build on knowledge structures already in place and apply their creativity to problem-based learning sets. Ideally, students involved in level-three problems will already have well-constructed knowledge, resulting from previously effective engagement with highly structured learning modules.

Digital content resources in support of learning need to map to students' needs and to students' readiness. Supporting the development of lasting knowledge structures continues to be art as well as science.

What is Different about Digital Content?

Given the richness of the digital resources available, we now think about content differently. Because content is digital, it is no longer bounded by space and less and less bound by format. Because content is digital, it may be combined and recombined. Because content is digital, it can draw on the combined power of graphics, animations, audio, and video. And because content is digital, it is easier for students to become creators of content that is custom made for the growing and nurturing of the knowledge structures in their own minds—to help them move from the Tundra Territory to the Garden State.

The development of course content is increasingly the work of artists, in particular those faculty who think visually. Edward Tufte, the author of seminal books on the display of graphic information, said it this way, "To envision information—and what bright and splendid visions can result—is to work at the intersection of image, word, number, art."

Judith V. Boettcher, Ph.D. is an instructional designer and consultant with expertise in distance education and online learning programs. Send her questions and comments at judith@designingforlearning.info.

Well-Structured Content: Coming to You Soon via XML

One of the emerging content standards is that of XML, eXtensible Markup Language. Well-structured content is what designers have when they use XML to mark up content.

XML is complementary to the HTML standard. Jeff Jones (www.swynk.com/friends/jones/articles/xml_101.asp) used the following analogy to describe the difference between XML and HTML: XML is to defining information as HTML is to displaying information. He goes on to note that while XML and HTML both are text-based and both use tags, elements, and attributes, XML allows users to structure and define the information in their documents. Additionally, XML is a meta-language that allows users to create their own tags, elements, and attributes as necessary.

What's powerful for designers of today's online learning environments is that the same XML document can be displayed in a variety of formats, such as HTML, MS Word, Adobe PDF, or text. Easy portability to handheld devices is also on the horizon. XML is the future for describing, manipulating, and transmitting data. The W3C (www.w3c.org/XML/) is the place to start learning about XML and its design roles for content.

XanEdu (zăn´ə-dōō)

n. Utopia for the mind.

Custom CoursePack Services

Digital CoursePack (dĭj´ĭ-təl ´kors´pak)

n. An online collection of articles, cases, web links and other copyright-cleared resources customized to fit an instructor's course syllabus.

Print CoursePack (prĭnt ´kors´pak)

n. A traditional collection of articles, cases and other scholarly materials, custom assembled to the instructor's need.

CoursePack Plus (´kors´pak plŭs)

n. A digital or print CoursePack that includes a module of the XanEdu™ ReSearch Engine, keeping a course current.

ReSearch Engines (re´sŭrch´ en´jənz)

n. A XanEdu online database offering access to thousands of newspaper, magazine and journal articles, organized by course area with daily updates.

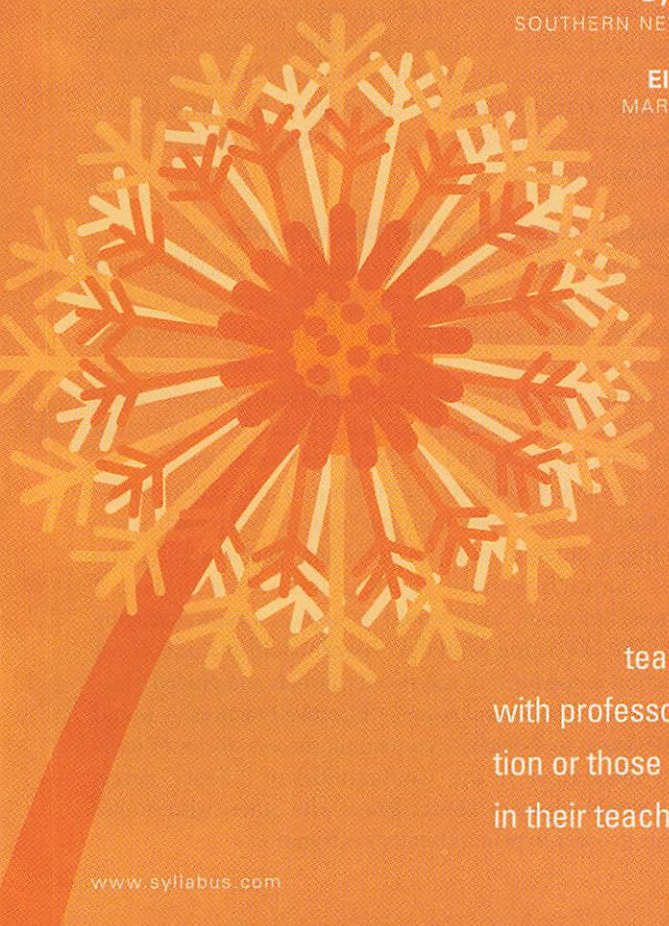
XanEdu™
UTOPIA FOR THE MIND.
From:ProQuest

Your CoursePack. Your Way!

Call 800.218.5971 or Log Onto www.xanedu.com

Faculty Development and the DIFFUSION of Innovations

By Jim Woodell,
SOUTHERN NEW HAMPSHIRE UNIVERSITY
and
Elaine Garofoli,
MARLBORO COLLEGE



Faculty are being asked to adopt, and adapt to, a number of information age innovations in teaching. While some have adopted these technologies enthusiastically, the majority of instructors have been much slower to integrate these new tools in their teaching. Faculty developers remain frustrated with professors who appear to resist technology integration or those who clearly refuse to use these innovations in their teaching.

What's needed is an examination of the source of the resistance. Why would some faculty be so skeptical when others have achieved great success and discovered new ways to increase learning outcomes? Why would faculty resist tools that can help them simplify their work? The answer is that not all believe in the inherent ability of technology to achieve these outcomes. They have to be convinced before they will integrate technology into their teaching.

These teachers have to be convinced based on their own needs and values. Of course, they likely share some of the values with those who are quick to adopt and adapt. Both groups are interested in improving students' learning, for example. However, there are important differences and these must be addressed if larger-scale integration of information technologies for teaching is to occur.

Once differing needs are assessed, a faculty development and support system sensitive to these differing needs should be established. Below, we outline a model for such a system and detail the theory and related literature behind it.

Early Adopters versus Early Majority (from Geoghegan, 1994)

Early Adopter	Early Majority
• Favor revolutionary change	• Favor evolutionary change
• Visionary	• Pragmatic
• Project oriented	• Process oriented
• Risk takers	• Risk averse
• Willing to experiment	• Want proven applications
• Generally self-sufficient	• May need significant support
• Horizontally connected	• Vertically connected

Diffusion of Innovations

Institutions attempting to establish faculty development and support that is sensitive to differentiated needs can benefit from work done 40 years ago by Everett Rogers on the Diffusion of Innovations (1962). The relevance of Rogers' ideas persists, and is perhaps more relevant now in the midst of the information technology revolution. Diffusion of Innovations theory can provide an excellent framework from which to design, promote, and deliver faculty development and support.

In our work with the University of Vermont, Marlboro College, and Tufts University, in conversations with numerous other institutions, and through a survey of the literature, we have confirmed the relevance of Rogers' Diffusion of Innovations theory. In turn, we have developed a framework for faculty development based on it. This framework provides guidance to institutions seeking to plan, develop, and implement both online and face-to-face faculty development opportunities.

Rogers' theory has been cited frequently—even in the last 10 years—in literature about instructional technology. Rogers' theory posits that a population can be categorized based on its tendency to be innovative ("Individual Innovativeness"). It also states that those who are more inclined to innovate will adopt an innovation before those who are less inclined. Rogers showed that the percentages of each of five categories within the target group coincides with a bell-shaped curve that illustrates Innovator (2.5 percent), Early Adopter (13.5 percent), Early Majority (34 percent), Late Majority (34 percent), and Laggards (16 percent).

In 1991, Geoffrey Moore used Rogers' ideas as a basis for a book about marketing high-tech products to a mass market. In the book, Moore (1991) talks about the "chasm" between the second and third of Rogers' categories: Early Adopter and Early Majority. He points out that consumers in these categories have very different reasons for adopting a technological innovation and marketers must address these differences in order to reach mainstream markets.

A number of authors in the field of education have picked up on this notion and have written about adoption of technological innovations by educators. Geoghegan (1994) confirms the existence of Moore's categories among college faculty and asserts that mainstream faculty members go largely unrecognized in faculty development and support for technology integration. Carr (1999) suggests that "needs-based diffusion strategies" be used. Donovan (1999) confirms that it's critical to "get to know faculty" to understand differentiated needs and expectations before effective faculty support can be implemented. Hagner and Schneebeck (2001) suggest an alternative set of categories, mirroring Rogers' five areas. They also emphasize that assessing faculty based on these categories is an important first step.

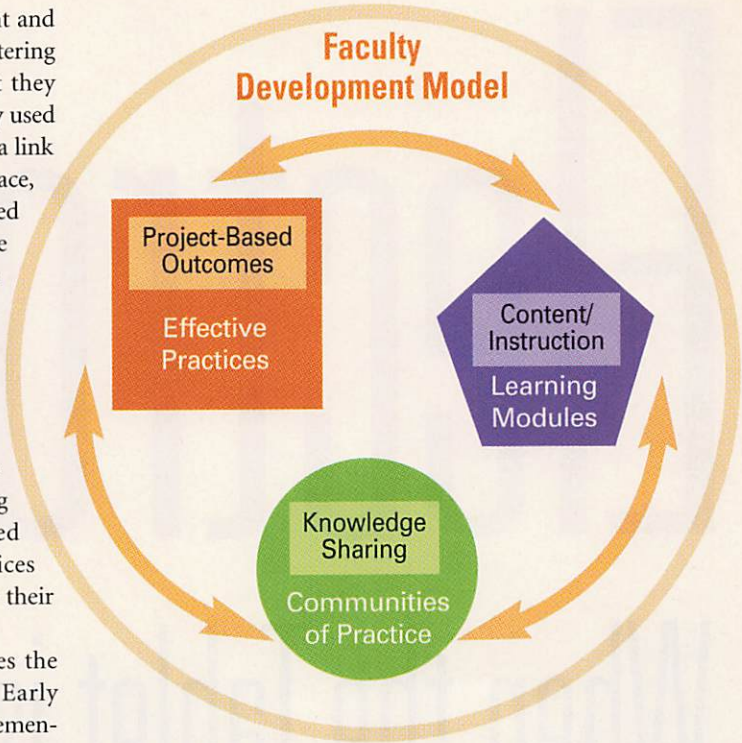
The central theme of all of the noted literature is that there are significant differences between people who fall into Rogers' Early Adopter and Early Majority categories. These differences create gaps in motivation and expectations. Such gaps should be recognized and bridged in order for large-scale technology integration to happen.

Diffusion-Based Faculty Development

The professional development framework described here includes strategies for bridging the gap between early adopter and mainstream faculty groups. The framework includes considerations of a variety of needs and expectations across the target groups. By attending to these needs, the framework helps developers achieve success in readying faculty for innovation and ensures that faculty will achieve desired outcomes.

Our framework suggests the creation of a faculty development structure that uses multiple "spaces," with each space providing a different point of entry into the structure. The spaces can include both physical and online tools and resources, but online tools would be used as a central starting point. The "Learning Modules" space would include direct instruction in the form of self-paced tutorials and guided practice activities. The second space—"Effective Practices"—would provide access to a database containing success stories of technology integration. In the "Communities of Practice" space, faculty would engage in conversations with others with similar interests in order to plan technology integration.

Content in each of the spaces is driven by the content and activity in the others. For example, a faculty member entering through the Effective Practices space may decide that they would like to learn how to integrate the same technology used in a particular story in the database. They would follow a link from the story to a tutorial in the Learning Modules space, or perhaps find out about a face-to-face workshop related to the technology described in the success story. On the other hand, they may decide to join a discussion with faculty members in their own discipline who have integrated technology in a way similar to the success story. They would then follow a link to an online discussion in the Communities of Practice space. In this way, the model provides encouragement for faculty to participate in each of the spaces, but does not require it. The model is also flexible and learner-centered, providing opportunities for faculty to engage in project-based learning, collegial communities, and effective practices research and demonstration at their own pace and by their own choice.



It is the flexibility of the framework that addresses the diffusion of innovations cited earlier. Imagine an Early Adopter who tends to be project-oriented in their implementation of technology. Their project orientation would support the development of a good success story for the Effective Practices space. A more pragmatic Early Majority faculty member would be able to study the success story for proof of the application's efficacy. The Early Adopter might also participate in a number of communities of practice, because of their horizontal interest in the application of technology. At the same time, the Early Majority faculty member, with their vertical connectedness, would be interested in a specific community formed around the interests of a shared discipline. There are a variety of ways that the open, flexible framework provides access to faculty development that are differentiated based on the needs and interests of Early Adopter and Early Majority faculty.

Testing the Framework

We have not yet overseen the implementation of such a comprehensive framework. However, concepts central to the framework have been developed through work with higher education practitioners, while components of the model have been prototyped. Limited feedback thus far confirms the relevance of the model, though it is clear that a careful process of assessing faculty and determining their categories will be critical to the model's success.

The faculty development framework outlined here provides for differentiated participation based on "Individual Innovations." Not all faculty members will be interested in using technology for the same reasons, nor will they have the same expectations about the outcomes they might achieve through technology integration. There are fundamental differences in the ways that people approach the adoption of an innovation, and programs designed to encourage such adoption must be sensitive to these differences.

*Jim Woodell (**j.woodell@snhu.edu**) is director of distance education at Southern New Hampshire University and Elaine Garofoli (**egarofoli@attbi.com**) is an online facilitator at Marlboro College.*

RESOURCES

Carr, V.H. (1999) "Technology Adoption and Diffusion," United States Air Force Air War College Gateway to Internet Resources. Available at www.au.af.mil/au/awc/awcgate/innovation/adoptiondiffusion.htm. Accessed October 7, 2002.

Donovan, Mark (1999) "Rethinking Faculty Support." The Technology Source, September/October 1999. Available online at http://ts.mivu.org/default.asp?show=article&id=612. Accessed October 7, 2002.

Geoghegan, William H. (1994) "Whatever Happened to Instructional Technology," paper presented at the 22nd Annual Conference of the International Business Schools Computing Association. Baltimore, MD.

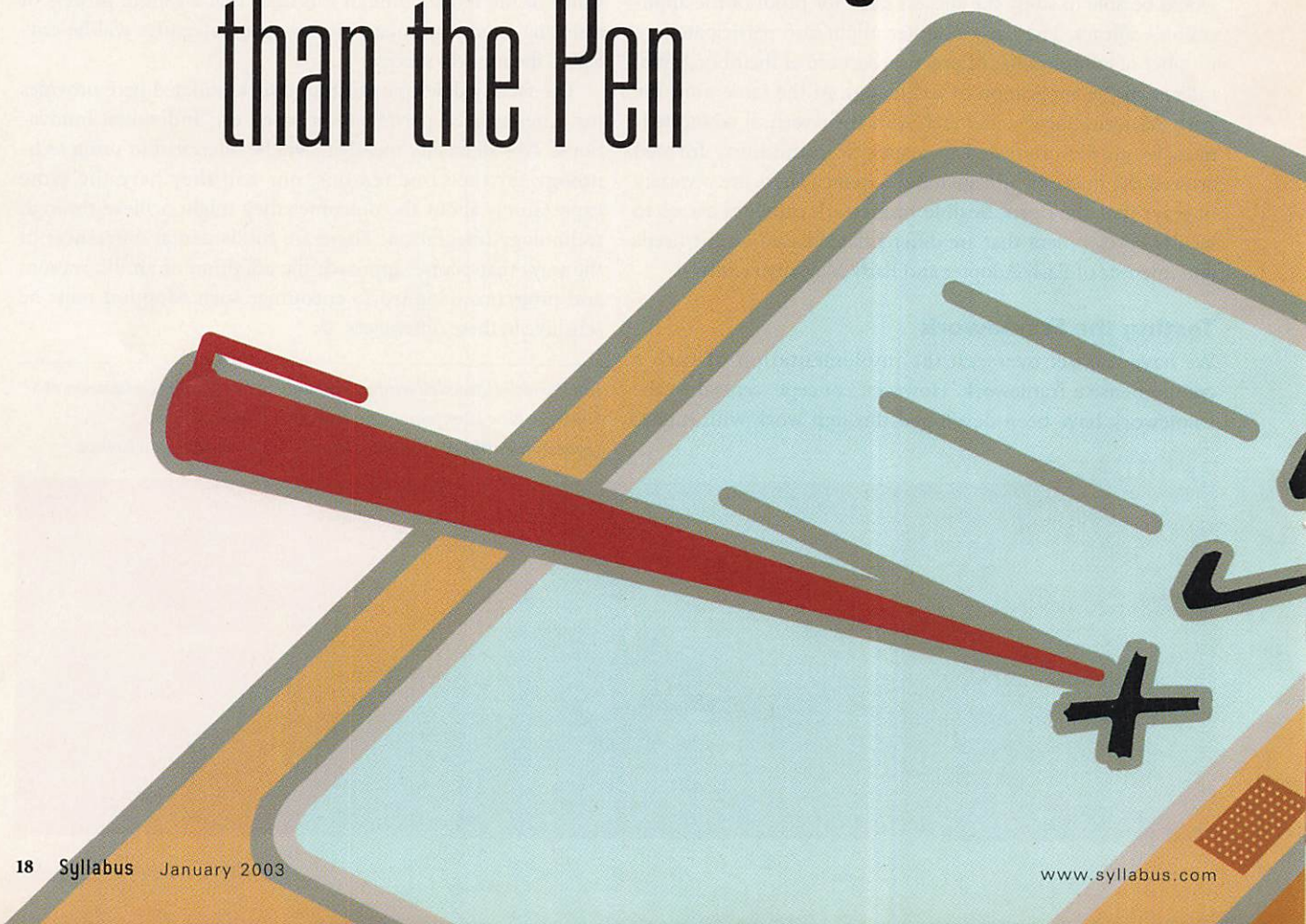
Hagner, Paul and Schneebeck, Charles (2001) "Engaging the Faculty," in *Educause Leadership Strategies, Volume 5, Technology-Enhanced Teaching and Learning: Leading and Supporting the Transformation on Your Campus.*

Moore, Geoffery. (1991) *Crossing the Chasm: Marketing and Selling Technology Products to Mainstream Customers,* New York: Harper Business.

Rogers, Everett M. (1962) *Diffusion of Innovations,* New York: Free Press of Glencoe.

Electronic G

When the Tablet is Mightier than the Pen

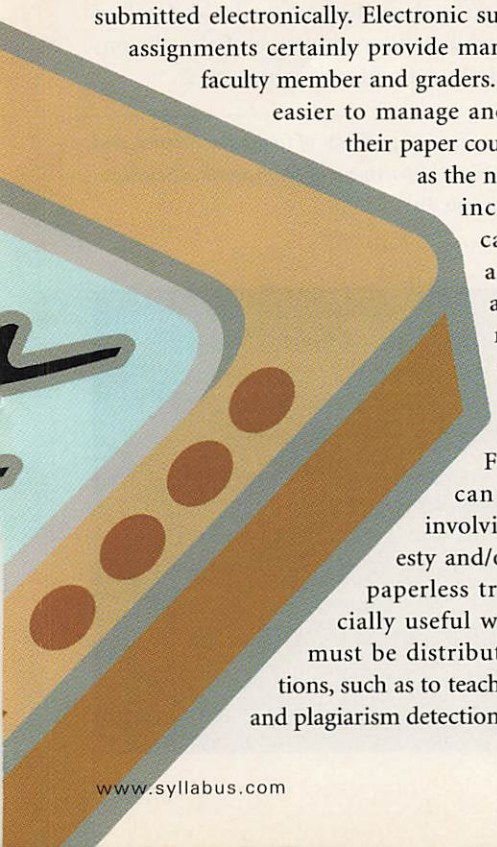


rading:

Jeffrey L. Popyack and Nira Herrmann,
DREXEL UNIVERSITY

Technological advances often seem to introduce as many obstacles as improvements. For instance, people seem to spend more time reading and writing electronic mail than they ever did with regular mail. Likewise, VCR use is sufficiently formidable to have inspired folk humor about how to program one.

And so it is with grading assignments that have been submitted electronically. Electronic submissions of student assignments certainly provide many advantages for the faculty member and graders. For instance, they are easier to manage and keep track of than their paper counterparts, particularly as the number of submissions increases. Submissions can be time-stamped automatically and archived, thus minimizing the potential for disputes over lateness and lost assignments and/or grades. Furthermore, archives can help resolve issues involving academic dishonesty and/or plagiarism. Finally, paperless transactions are especially useful when the assignments must be distributed to multiple locations, such as to teaching assistants, graders, and plagiarism detection software.



Drawbacks of Electronic Submission

Assignments submitted electronically are not without drawbacks, however. People are more familiar with manipulating paper documents and editorial markup, in particular, has been much simpler with a paper document. Consider, for instance, a student composition submitted as a text document where the grader wishes to cite a particular passage as requiring revision. On a paper document, the grader simply circles the offending passage, crosses out a few words, draws arrows or other editorial markings, and writes remarks directly on the paper. The grader's remarks (perhaps in red ink) stand out as distinct from the original submitted work, and context is understood from their location on the paper. The grader can work in close or cramped quarters, compare papers side-by-side, and easily flip back and forth between pages.

With a document in electronic form, the grader must decide how best to convey remarks while leaving the original submission intact. Users have tried a variety of approaches, but to date, they have all posed some drawback in practical use. One approach is to print a copy of the original document, then mark it up and return it. This, however, places the burden of printing on the grader (prohibitive in time and expense for large classes), and does not preserve an archival record of the grader's remarks.

Another approach is for the grader to type a separate document with remarks for the student (e.g., "on page 3, first paragraph, change <original text> to <new text>"). This process requires more of the grader's time and also sacrifices the clarity that is inherent with direct markup. Yet another approach that works when grading word processor documents is for the grader to make desired changes to the document using built-in tracking features (e.g., Microsoft Word's "Track Changes" tool). This changes the student's submitted work, however, and makes comparison of the revision to the original difficult.

Pen-Based Alternative

We have developed an alternative that combines the best of both approaches: It allows graders to write free-hand comments in colored "electronic ink" on the student's submission while preserving the paperless, electronic nature of the submission. This allows archiving of graded copies and electronic return of graded assignments to students. The approach makes use of pen-based tablets and Adobe Acrobat's Portable Document Format (PDF). Adobe's Acrobat software provides a means of marking up PDF documents with an electronic pen, so the resulting document resembles the original with the grader's notations overlaid, much like a graded paper assignment. Acrobat also allows creation of "stick-on

notes" containing ASCII text. PDF documents may use external or embedded scripts written in Acrobat JavaScript, which allow access to and manipulation of document elements. Perhaps most importantly, Acrobat allows a PDF document to be digitally signed and locked, so that a grader's notations cannot be changed by another party afterwards.

Hardware Interfaces

Acrobat's electronic pen feature may be invoked by clicking a toolbar button and using the mouse as a pen, but such usage is obviously clumsy and inaccurate. Fortunately, inexpensive pen-based tablets are now available (e.g., the Wacom Graphire 2 graphics tablet costs less than $100 and features a cordless pen). The use of a pen-based tablet requires some hand-to-eye training, but is otherwise simple to use. More advanced tablet models are available, but their features are more useful for artists than graders, and their costs are comparable to PCs.

More expensive but easier to use are Tablet PCs, whose screens may be written on directly with a special stylus. Several manufacturers, including HP and Toshiba, released Tablet PCs in November 2002 to coincide with the release of the new Microsoft Windows XP Tablet Edition operating system. The industry's attention to these devices promises a new era when pen-based input will become a standard mode of computing.

Project DUPLEX

At Project DUPLEX (Drexel University Programming Learning EXperience), we have been investigating various ways to use technological advances to enhance the quality and delivery of large computer programming classes, while reducing costs of course administration. Using the WebCT course management system, we have found that electronic submission of assignments and lab exercises has made some aspects of course delivery simpler while confounding others. A typical offering of our Computer Programming I class comprises 250 students in two lecture sections and 10 to12 lab sections, with two instructors and eight to ten teaching assistants, lab assistants, and graders. Before using WebCT, we found management of assignments and lab exercises submitted on paper to be complex, error-prone, and time-consuming. Student assignments were frequently lost; student claims of lost assignments were difficult to verify. Sorting and distributing assignments to their respective graders also took time.

While these concerns were greatly alleviated through the use of electronic submission, we found a whole new set of concerns emerged. The greatest of these was the amount of time it now took graders to grade assignments. Downloading a set of assignments was time-consuming enough, but once obtained, our graders were either spending double the time previously needed to grade a computer program, or were not providing a desired level of feedback.

To alleviate this situation, we created Labrador, a Perl-based client that interfaces with WebCT to download student submissions in a variety of formats and convert them to PDF format, where they may be graded electronically. Labrador is still in development, but will be generally available as an aid in accessing assignments from WebCT, converting the assignments to appropriate formats for pen-based grading or submission or plagiarism detection software and other electronic processing.

We have experimented with several approaches to grading student assignments and find a combination of pen markup and stick-ons works best.

We have experimented with several approaches to grading student assignments, and find a combination of pen markup and stick-on notes works best. Handwriting recognition is not an issue at present. We have used the Wacom tablets and Sony Vaio, and are experimenting with a new Tablet PC.

Good Old Days

The late computing science pioneer, Edsger W. Dijkstra once described himself in this way: "... he writes, in fact, so much that he cannot afford the use of time-saving devices such as word processors. He owns, however, several fountain pens, three of which are Mont Blancs, for which he mixes his own ink." As in Dijkstra's sentiments, we hope to find the use of the pen-based grading to be no more time-consuming than in the "good old days" of paper-based grading, while taking advantage of the obvious advantages of electronically submitted assignments.

Jeffrey L. Popyack, Ph.D., is associate professor of Computer Science, and Nira Herrmann, Ph.D., is chair, Department of Mathematical Sciences, at Drexel University, Pittsburgh, Pa.

REFERENCES

Herrmann N., Popyack J., Char B., Zoski P., Cera C., Lass R., Nanjappa A. Redesigning Introductory Computer Programming Using Multi-level Online Modules for a Mixed Audience. Submitted for publication (http://duplex.mcs.drexel.edu).

Cera C., Lass R., Char B., Popyack J., Herrmann N., Zoski P. Labrador: A Tool for Automated Grading Support in Multi-Section Courses. WebCT 2002, 4th Annual Users Conference, Boston, Massachusetts, July 24-26, 2002.

Dijkstra, E., "On the Cruelty of Really Teaching Computing Science", from "A Debate on Teaching Computing Science", Denning, P., *Communications of the ACM* Vol. 32, Issue 12 (Dec. 1989), pp 1397-1414.

JENZABAR
Smart Solutions for Higher Education

Did *your* students register on the Web?

Ours did.

Jenzabar spoke with Charleston Southern University's Chief Information Officer, Rusty Bruns, about the completion of its Web Pre-registration period in November using Jenzabar's Web products. "Web services are something that the students expect. Schools that don't offer Web services are at a great disadvantage."

These students have never had to wait in line at a bank because they have used ATMs their whole lives. This is what the "ATM generation" expects from the information systems deployed on your campus. This is exactly what Jenzabar is delivering via the Jenzabar Internet Campus Solution™.

Powered by our i³ strategy, Jenzabar's Internet Campus Solution™ delivers the benefits of an integrated, intelligent, internet-based system to your campus. It's a total campus solution consisting of a campus portal, an ERP system, and Data Mart enterprise reporting.

Convenient. Stress-Free.
"Our job is to do the best we can for the students. They are our customers. Having Jenzabar's Web products makes for less stress on the whole campus. When 78% of the students can register on their own, the faculty have the freedom to advise the students who need more attention."

–Rusty Bruns, CIO
Charleston Southern University

D E L I V E R I N G
intelligent integrated internet

i³

JENZABAR
Smart Solutions for Higher Education

Contact us today!

17 Sellers Street
Cambridge, MA 02139

1.877.536.0222

www.jenzabar.net

Sally M. Johnstone

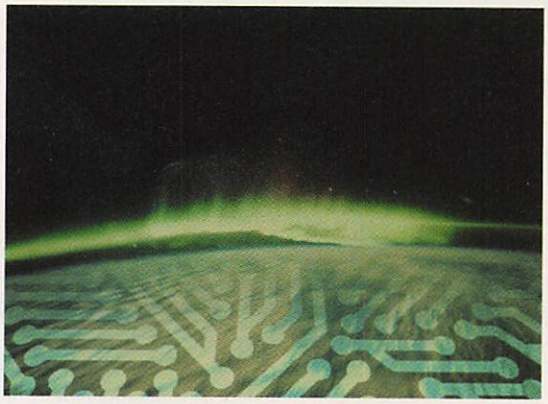
As founding director of the Western Cooperative for Educational Telecommunications (WCET) at the Western Interstate Commission for Higher Education (WICHE), Sally Johnstone serves as a resource on higher education technology issues. She also serves on the Board of the American Association of Higher Education, the U.S. Open University's Board of Governors, and the Advisory Panel for the Consortium for the Advancement of Private Higher Education.
sjohnstone@wiche.edu

Some Light on the Higher Ed Horizon

As another year dawns, the economic outlook for U.S. public higher education institutions is pretty bleak. However, I think there are some bright spots on the horizon for those of us who work with electronically delivered classes and programs.

More faculty members than ever before are using technology to provide academic services to students. At the recent Western Cooperative for Educational Telecommunications (WCET) conference, Gartner Research Group predicted that by the end of this year 80 percent of higher education institutions will have a single, enterprisewide course management system. While most of the students using these resources will also be taking face-to-face classes on their campuses, many will be distance learning students. That means more place-committed students will be able to have access to higher education.

As more faculty members are using course management systems, they are looking for ways to save some of their time by not creating everything they use. While they want to create a unique "class" for their students, they are realizing they can take advantage of some of the open educational resources now available for them. MIT's course materials are coming online (www.MIT.edu); Rice University's Connexions project (www.cnx.org) will provide open-access teaching materials; The MERLOT project (www.merlot.org) continues to make learning objects available for faculty to use. In addition, the faculty that created Virginia Tech's Math Emporium (www.VaTech.edu), which has lowered costs and increased the quality of students' learning, is willing to make their software available in an open format for faculties at other campuses to adapt and use. I like to think of all these types of projects as gifts to the world.



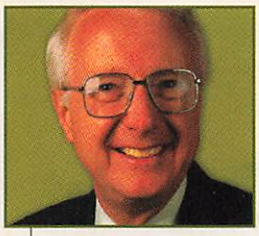
In addition, state leaders are finally looking at policies and practices that have been inhibitors to institutions using distance learning to serve students. These barriers usually inadvertently developed as they evolved to address problems prior to the current capabilities of technology to effectively serve students. One of the most common barriers involves differential funding for electronic and face-to-face classes. In many states electronically delivered classes were funded at a percentage of on-campus classes or not eligible at all for state reimbursement. This is beginning to change as policymakers in several states are realizing they need to serve more students for little increase in cost. They hope to divert some of the students' activities away from campuses and realize they must fund the campuses to make it worthwhile.

Finally, as Dennis Jones, president of the National Center for Higher Education Management Systems, always points out, 85 percent of campus budgets are tied up with people. Cutting the budgets for savings from the other 15 percent makes little sense when campuses are seeing serious budget deficits. The technology budgets fall into that other 15 percent. Rearranging how people on campuses work and what they do is the only way to really change the costs of serving students. Hopefully, state and campus decision makers will understand this and focus their efforts on helping change faculty and staff activities.

While things may seem a little bleak this new year, I think we will see dramatically increased opportunities for creative thinkers. We have an opportunity to encourage the adoption of some new ways to use technologies for teaching and learning.

I wish for each of you a peaceful 2003.

Photo/PNI



David G. Brown

David Brown is vice president and dean of the International Center for Computer Enhanced Learning. He has served as president of Transylvania University, chancellor of the University of North Carolina at Asheville, and chair of several national groups, including the AAHE and the Higher Education Colloquium. As provost of Wake Forest University, he founded the Annual Conference of Ubiquitous Computing Colleges and Universities, and founded the Journal of Computer Enhanced Learning.
brown@wfu.edu

An Interactive Community Awaits You

It's free, easy, reversible, and the proven way to learn!

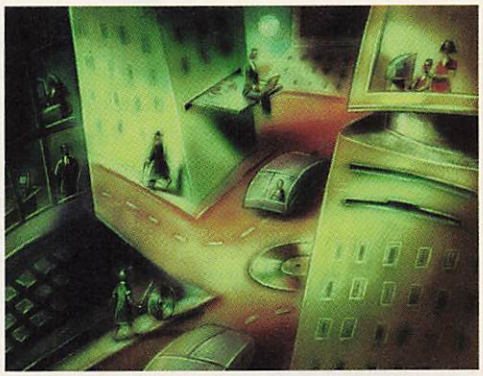
Beginning the day this publication hits mailboxes, the Syllabus Forum on Faculty Best Practices is an opportunity for us to "talk (asynchronously) with each other," to "practice what we preach" and to "learn by the methods we are redesigning into our teaching." The Forum is a way to be interactive—and therefore personally learn more—about faculty practice.

To join this virtual-community-in-the-making, log on at www.syllabus.com. As long as you remain active, you'll be a member of the Syllabus Forum on Faculty Best Practices.

Membership involves responding to a question about pedagogy. A question will be posted online about six times a year. You will be expected to respond, preferably with two or three sentences, at least once a year.

The Forum Issue for January is: "Please share one practical idea about teaching with technology that will likely be useful to teaching faculty."

No later than Jan. 30, please post two or three sentences about the topic in the forum. Include your name and, if appropriate, your institution and title. We can then all react to each others' ideas.



Other topics for future discussions might be, "the learning theory that informs my approach to teaching is ...," or "my personal list of teaching tips includes ...," or "how to take advantage of a wireless classroom," or "my most effective use of our course management system entails ...," or "things I have tried but failed and why." If you would like to select a topic for a future Faculty Best Practices forum, you can do that as well.

Please do try out the Forum. Join today by posting an answer to the January topic at www.syllabus.com. Remember that your answer should focus upon information that you believe will be most useful to others.

Among other benefits, participation in the forum will teach each member what it means to be a learning member in a virtual community. This is wise and appropriate experience for those of us who are the lead or teaching members of communities we create. It's good for us to get a student-eye view of interactive learning in a virtual environment. And, if the prevailing wisdom about the power of learning that's interactive is correct, we'll all learn more.

Please share one practical idea—an experience, an insight, the URL of a helpful Web site, a valuable conference, whatever! Do it now! Thanks!

Register for Syllabus Forums!

To register for David Brown's Faculty Best Practices Forum, go to www.syllabus.com, click on Community, and then select the Forums link. The Forums page will list the Faculty Practice discussion, as well as other Syllabus Forums on eCommerce and Entrepreneurship on Campus, Faculty Development, and eLearning Systems.

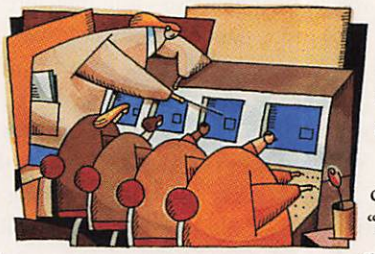
At the top of the listed Forums is a Register button (located next to the Login, Active Topics, Search, and Members buttons). Clicking on the Register button will take you to the Forum rules and policies. If you agree to these, click on the Accept button at the bottom of the page. Next, you will be asked to fill out a short form. The only required information is a username and password; the other information is about your personal preferences for how you would like to participate. Once you've completed this step, you will be a registered Syllabus Forums user, where you can interact with your peers and moderators in the Forums of your choice!

Steven W. Gilbert

Steven Gilbert joined the American Association for Higher Education (AAHE) as Director, Technology Projects, in July 1993. He founded the TLT Group as the Teaching, Learning, and Technology Affiliate of AAHE in January 1998. He was previously vice president of EDUCOM, where he created and led the Educational Uses of Information Technology (EUIT) program and the EDUCOM Software Initiative (ESI). He also moderates the Internet listserv AAHESGIT.
gilbert@tltgroup.org

Conquering the Support Service Crisis

Even though the recession has put many technically skilled and knowledgeable professionals back into the job market, most colleges and universities still have trouble finding, hiring, paying, and keeping tech support staff. Now, many colleges and universities are experiencing severe financial pressures—most notably at some state college and university systems, some community colleges, and some smaller liberal arts colleges. We are already seeing staff cuts in professional development and some unprecedented budget cuts for technology support.



Just as more faculty are asked to learn new ways of teaching and supporting their students' learning, their willingness and ability to participate in conventional professional development activities is reduced. Recent additions to faculty responsibilities, budget "adjustments," and staffing reassignments have already increased the typical faculty workload.

Travel and other professional development budgets are often cut or held steady—resulting in declining attendance at non-local workshops and conferences where faculty might learn new teaching approaches. Many faculty development professionals also report declining participation rates for conventional on-campus faculty workshops.

In recent columns I've talked about some different approaches for helping faculty improve teaching and learning under new conditions. I'm urging that in these difficult times, academic administrators in higher education institutions identify and support the best use of their own unique resources—professional staff, faculty, and students. I urge that these institutions develop or continue to support Teaching, Learning, and Technology (TLT) Centers, or Virtual TLT Centers. If that isn't feasible, at least coordinate the work of academic support professionals (librarians, faculty development, technology support, instructional design).

These Centers or teams should:

- Find and use "low-hanging fruit" or Low-Threshold Applications (LTAs).
- Develop small "clusters" or highly organized, highly-focused sets of Web links to a modest number of highly selected instructional resources—especially LTAs.
- Identify and support collections, repositories, and "referatories" –good mechanisms for those who build selective clusters to tell others about them and make them accessible.
- Use tools and principles of the Open Source software development community to whatever extent appropriate and feasible.
- Develop Student Technology Assistant programs in which students learn to train and supervise other students who provide technical support and help faculty with instructional uses of technology.

In response to these new conditions and as a means of helping with these solutions, most campuses will benefit from reducing the duration and increasing the frequency and variety of professional development activities available to faculty and other academic professionals. We continue to hear about the increasing success of offering very focused, very short sessions (thirty minutes to one hour). The TLT Group has begun pilot-testing "Online Brown Bag Lunches" in which a Web cast is offered at lunchtime and a Web site is made available in advance. Leaders of the local sessions can download and adapt discussion or activity guides for their own use.

We welcome your help in shaping this new approach or participation in these events.

Illustrated by Robin Jareaux

New at www.syllabus.com

Announcing SYLLABUS RADIO

Log on and Listen

Your community is on the air!

Syllabus Radio. Hear audio interviews with established leaders and creative thinkers in higher education as they discuss the good, the better and the best uses of IT on campus. Each week, Syllabus Radio explores a new issue with a new scholar. Join host Judith Boettcher as the magazine for technology in higher education speaks with a new voice.

New interviews posted every Monday:

- **January 6**
  John Di Marco
  Long Island University
- **January 13**
  Margaret M. Thombs
  Roger Williams University
- **January 20**
  Jeffrey L. Popyack and Nira Herrmann
  Drexel University
- **January 27**
  Nishikant Sonwalkar, Ph.D.
  MIT

Also new within the community pages of syllabus.com:

Forums.

Reach out to your peers on Syllabus Forums—threaded discussions on such wide-ranging topics as e-learning systems, faculty development, and entrepreneurship on campus.

Calendar.

Get a line on upcoming high-tech, higher education conferences, seminars, webcasts and meetings taking place each month.

Visit **Syllabus.com** for a whole **new look** and a whole **new world** of collaboration.

Syllabus
TECHNOLOGY FOR HIGHER EDUCATION

Accessible Web

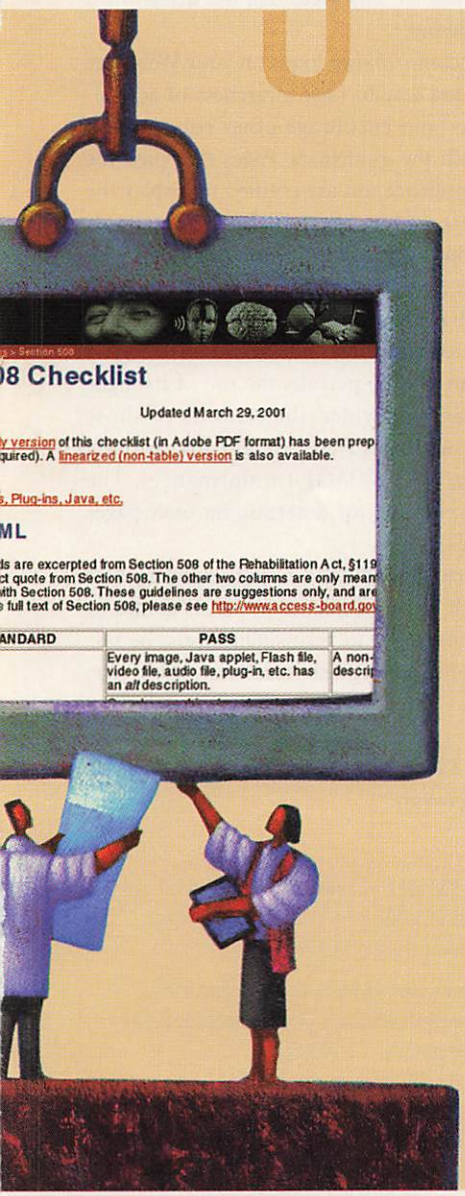
Advice for Educators

Margaret M. Thombs, ROGER WILLIAMS UNIVERSITY

The Internet has become an integral part of the educational process. Online research, Web-enhanced courses, and textbook-companion Web sites are just a few of the areas in which teachers and students have seen the benefits of using this technology.

While educators have embraced the responsibility of providing equal access to educational resources to all students, Internet technology presents new challenges in this area. Students who have vision or hearing problems, who have difficulties with motor control, or who face other challenges, such as learning disabilities or language barriers, may find the Web difficult or impossible to explore. Educators who use the Internet in their instruction or who create their own Web pages need to be aware of the laws governing universal access to technology. Once familiar with these guidelines, teachers need the skills that will enable them to ascertain whether or not the Web pages they use are accessible. They also need to be able to make certain the Web pages they create meet the same criteria.

Pages:


08 Checklist
Updated March 29, 2001
ML
ANDARD
PASS
Every image, Java applet, Flash file, video file, audio file, plug-in, etc. has an alt description.

Checking Your Site for Compliance

Educators who create Web pages need to become familiar with the accessibility guidelines and take steps to ensure that the pages they create comply. An online checklist can be found at *www.Webaim.org/standards/508/checklist.*

Below is a summary of some of the important considerations:

- **Text equivalents for non-text items:** Without a text description, a Web reader program cannot reference elements such as images, applets, audio, and video. The ALT attribute in the HTML tag is used to provide a text description for these elements.

- **Alternatives for multimedia:** Any audio, including that contained in video clips, on a Web page needs to have synchronized captions.

- **Use of color:** When color is used for informational purposes, another way of presenting that information must be included. The use of contrast in the color scheme needs to be considered.

- **Image maps:** Provide redundant text links for server-side image maps. Provide ALT descriptions for the image and all "hot spots" on client-side image maps.

- **Tables:** Provide column and row headers for all data tables. This is not necessary if the table is used for formatting only.

- **Frames:** Give each frame a title using the TITLE attribute in the HTML tag.

- **Flicker rates on animations:** Elements must not flicker at a rate between 2Hz and 55Hz. This is necessary to prevent optically induced seizures. If your site is hosted on a server that includes Web pop-up ads, this can be a problem.

- **Online forms:** All form objects must have associated text labels. The HTML code includes labels in the tag for each item.

- **Text alternative pages:** If compliance cannot be accomplished in any other way, provide a text-only page. This page must be kept current with other pages.

- **PDF files:** Adobe Acrobat Reader 5.0 allows screen-reader access.

Rules and Guidelines

Section 255 of the 1996 Telecommunications Act requires that telecommunication services and products are accessible. Section 508, the 1998 amendment of the Rehabilitation Act, (www.section508.gov/) requires that federal agencies make their electronic and information technology accessible to all people, including those with disabilities. The Americans with Disabilities Act of 1990, designed to protect the rights of citizens with disabilities, included a provision for access to telecommunications. An independent federal agency, the Access Board (www.access-board.gov/), was created to oversee and ensure accessibility and a set of guidelines was developed to assist with compliance. Although these laws specifically address the responsibilities of federal agencies, educators need to consider the responsibility that they have to educate all students and make every effort to provide technology that is accessible.

Pages that pass the Bobby compliance test are entitled to display the appropriate Bobby logo.

Gaining Insight

An important first step for educators is to gain some insight into the ways that people with different challenges experience the Internet. WebAIM (www.Webaim.org), an organization devoted to "expanding the Web's potential for people with disabilities," has a number of excellent resources. An online video explaining some of the pertinent issues can be seen at www.Webaim.org/info/asdvideo/. What's more, simulation tools are available that allow a user to experience the Web just as users with vision problems, such as glaucoma, macular degeneration, or cataracts (www.Webaim.org/simulations/lowvision). Another has a screen-reader tool designed for individuals with little or no vision (www.Webaim.org/simulations/screenreader). A link is provided to yet another tool (www.vischeck.com/vischeck/ vischeckURL.php) that simulates the effects of color blindness. The frustration users experience using the Web under these conditions are an excellent motivating force for designing Web pages with accessibility in mind.

Determining Compliance

A number of online tools are available that help the user determine the level of accessibility for existing Web pages. One such tool, called Bobby, allows users to test single Web pages online for compliance with either the Section 508 guidelines or the guidelines established by the Web Accessibility Initiative (www.w3.org/wai/). This tool can be helpful for educators who are using Internet sites in their curriculum and want to determine the level of compliance. To test a Web page using Bobby, go to http://bobby.watchfire.com/bobby/html/en/index.jsp, enter the URL of the Web page, choose the type of guidelines, and click the submit button. A report will be produced that rates the level of compliance and details the problems and possible issues with the page. A downloadable version of Bobby can be purchased that permits the testing of entire Web sites.

Most solutions necessitate some familiarity with and access to the HTML code. Many teachers who create classroom Web pages do so with WYSIWYG (What You See Is What You Get) tools that do not display the code. Fortunately, there are some good tutorials available online that can assist Web developers. One such site is provided by WebAIM and is found at www.Webaim.org/howto/. Tutorials are available on a wide range of topics and software products, including Microsoft FrontPage and the Macromedia products Dreamweaver and Flash. Other tutorials cover captioning, keyboard accessibility, PDF files, PowerPoint, and JavaScript. Another useful tool is the Bobby compliance report, which provides samples of correct HTML syntax for any areas that are determined to be problematic.

Placing conformance logos on your Web page is also a good way to raise awareness of accessibility issues and encourage other educators to comply with the guidelines. Pages that pass the Bobby compliance test are entitled to display the appropriate Bobby logo. If the report states "Bobby Approved," a link is provided to an icon guidelines page that contains downloadable icons and HTML code that can be used to display those icons. The World Wide Web Consortium (W3C) permits the use of its logos on Web pages provided the creators of those pages verify compliance with the Web Content Accessibility Guidelines (www.w3.org/WAI/WCAG1-Conformance). The content providers are responsible for determining their pages comply with the guidelines.

As educators, we need to be dedicated to providing the best experiences we can for all of our students. When it comes to technology, a strong commitment to accessibility must be our goal. The tools and assistance we need are readily available. The rest is up to us.

Margaret M. Thombs, Ph.D., is an assistant professor in the School of Education, Roger Williams University.

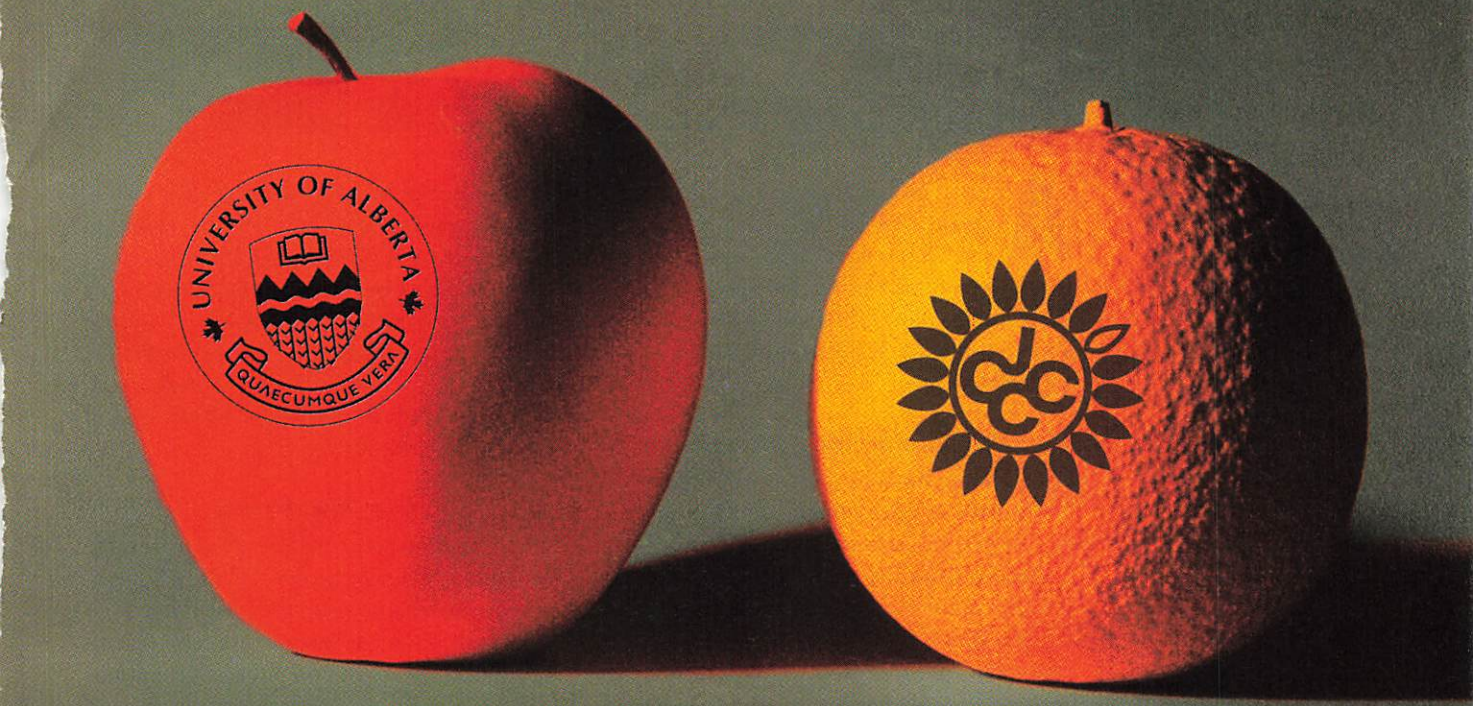
REFERENCES

Bonham, P. (2001). Section 508 Web accessibility checklist for HTML. Retrieved August 10, 2002 from WebAIM Web site: www.Webaim.org/standards/508/checklist.

Robertson, J.S. (2002, July/August). Making online information accessible to students with disabilities. The Technology Source, Article 948. Retrieved September 16, 2002 from http://ts.mivu.org/default.asp?show=article&id=948.

"Universal Design and Disability Access to the Web." (2002, Summer). *Access New England,* 6(3), 1, 12-14.

Their missions couldn't be more **different.**



Their course management system couldn't be more **perfect.**

Learn how to get your complimentary copy of the case studies on these institutions from the recent Eduventures "Meeting the Mission" report...

One institution enrolls more than 30,000 students as one of Canada's largest research-intensive universities. The other is a community college in the state of Kansas dedicated to launching innovative programs to meet the educational and professional development needs of its students. Both have implemented the WebCT course management system campus-wide as a decisive step in achieving their unique goals.

With deep roots in education, technology, and enterprise management, WebCT is the most qualified partner in the industry to take your institution to the next level of e-learning. Educators will find the WebCT platform easy to use and completely customizable to suit teaching and learning needs.

It integrates seamlessly with existing IT infrastructure, as well as adhering to industry standards. And the responsiveness and expertise of WebCT's dedicated support team has resulted in the highest level of customer satisfaction in the industry. No matter what your mission is, WebCT offers the technology, tools, and services that forward-thinking institutions need to achieve their e-learning objectives.

To download the Eduventures case studies on University of Alberta and Johnson County Community College, visit www.webct.com/casestudy. Or to begin your path to e-learning success, call us today at 1-877-WebCTme (1-877-932-2863).

WebCT™

University of Washington's new Catalyst Portfolio Tool goes beyond grades to display students' learning artifacts;
University of Houston employs online writing assessment tool for efficient proficiency testing;
University of Memphis manages growing network with KVM switch;
Dakota State exploits the Internet to arm graduates with enterprise software experience;
Claremont consortium connects back-end administrative systems with Web-based student portals.

University of Washington

Students Showcase Achievements Online

After 18 months of research and collaboration with student interest groups, career counselors, and academic leaders, the University of Washington (UW) launched the Catalyst Portfolio Tool—an electronic archive of work produced by students—in September 2002.

Web Publishing Made Easy

The Catalyst Portfolio Tool uses UW network and storage infrastructure and allows students to compile any electronic files of their work. Using nothing more than a Web browser, students can save and organize papers, pictures, audio clips or any other documents they produce. The beta release has a temporary storage quota of 10MB per student, but by the end of January, it will increase to 250MB to 500MB per student. Unless students exceed this quota, no limits will be placed on the size and type of the files. A system is also being built to allow students to store large streaming media files in another university archive without using their quota.

"They get to keep everything they've done on campus in an online environment where they can access it quickly. They can do all of this without knowing anything about Web publishing," explains Mark Farrelly, coordinator of the Portfolio Tool project at the UW office of Educational Partnerships & Learning Technologies. Templates and style sheets are provided to format and customize each portfolio, and students can re-organize and align their learning artifacts however they like, so that each portfolio they publish is unique.

If students need help, technical assistance is provided in a couple of different ways. Student helpdesk employees have been trained in each of the largest student computer labs on campus to provide face-to-face support. Materials, including online help and documentation (developed by four student employees and one editor) are also available. In addition, students can contact the developers of the Portfolio tool by e-mail or telephone (four software developers and one student helper are available for e-mail help).

Showing What You Know

Farrelly says the new portfolios are a reaction to the need to provide better ways to show achievement. Increasing competition in everything from top-paying jobs to entrance in exclusive schools is putting the emphasis on physical demonstrations of what you know. Grade-point averages and test scores, while still important, are being complemented by concepts like the final project and the work portfolio. "I think this is certainly a way for students to tell you, 'These are my skills,' instead of the increasingly less-meaningful grades," Farrelly explains.

Because the Catalyst Portfolio Tool is not tied to any particular program of study at the university, any instructor can use the tool to offer assignments designed to go into the portfolios, and to give students feedback online. Once compiled, students will be able to show off their portfolios to anyone in the world with a connection to the Internet. Each portfolio (there are no limitations to the number of portfolios a student wishes to publish) has a unique URL, and by the end of January a password-protection option will be added.

Enrolled students gain access to the Portfolio Tool with a system-wide login called a UWNetID, which provides access to other UW tools and services, such as e-mail and Web publishing. The IDs are active for six months after graduation. After that time, alumni can enroll in the MyUW.net program that allows them to keep all of their services, including the Portfolio, as long as they pay a nominal monthly fee. If students choose not to continue with their

subscription to MyUW.net, they can use the Portfolio tool at any time to download all of their published portfolios and collections of learning artifacts.

Instant Results

The Catalyst Portfolio Tool is the latest Web-based tool from the Catalyst Initiative, an effort to improve teaching and learning at the UW through the use of technology. The Catalyst Initiative relies on in-house staff, student workers, and existing UW infrastructure to develop Web tools, without outside vendors or proprietary software. Developing the Portfolio in-house permitted focus groups—made up of students, faculty, and administrators—to provide immediate feedback so that their needs would be met, allowing for instant implementation on campus.

One example of instant implementation of the Portfolio Tool is the Freshman Interest Group (FIG) program. FIGs are clusters of 20 to 25 freshman who enroll in the same classes and attend a general orientation class once a week, to help them negotiate life on campus of the UW. As part of the FIG program, the online system is providing more than 80 percent of the freshman class with the ability to reflect on their education and progress through their university experience. Currently, there are 3,200 FIG students using the Portfolio Tool to reflect on seven topic areas: transitioning from high school, embracing diversity, academic planning, working with faculty, social issues, an intellectual excursion, and an arts excursion.

"This will be a nice tool for students to think about their learning, their career path, and to get a better sense of what they did at the University of Washington," notes Farrelly.

For more information on Catalyst, visit ***http://catalyst.washington.edu/*** *or contact Mark Farrelly at* ***mfarrell@u.washington.edu*** *or Tom Lewis at* ***tomlewis@u.washinton.edu.*** *Farrelly is the outreach coordinator and Lewis is the director of the Ed-Tech Development Group for the Office of Educational Partnerships & Learning Technologies.*

University of Houston

Online Writing Assessment Enables Effective, Efficient Testing

In keeping with the Texas Academic Skills Program (TASP)—an instructional program designed to ensure that students attending public institutions in Texas have the academic skills necessary to perform effectively in college-level work—Texas universities must evaluate the reading, mathematics, and writing skills of each student entering public colleges and universities. With over 4,000 incoming freshman each year, many of whom have never taken the SATs, the University of Houston faced a daunting task.

The University of Houston needed to assess each student's writing ability for proper placement in English classes. This required students sit for a five-hour test, which included an essay portion, and then wait six weeks to receive their scores because the tests were sent to a central scoring office, and the results mailed back. The slowness of the entire process resulted in the University of Houston counselors meeting several times with each student. This was time-consuming and left the counselors with less time to address other academic needs of the incoming students.

"We clearly needed a faster way to conduct the writing assessments, as well as immediate feedback on each [test]," explains Gary Greer, director of academic counseling at the University of Houston.

Even more important, the University of Houston needed a way not just to assess incoming students' writing abilities at the beginning of their freshman year, but also later in their academic careers. To meet requirements for graduation at the university, students must be able to pass the Junior Writing Proficiency Exam, in which they must demonstrate they can write at the level of a college junior or senior. With an emphasis on focus, clarity, and grammar, this test ensures that students cannot move on academically until they have mastered the appropriate writing skills for their current class year. At the University of Houston's University College, which Greer calls "the home of all undeclared majors," students must take and pass the exam before they are allowed to officially declare a major and move forward in their studies.

Efficiency with AI

The University of Houston found a solution in ACCUPLACER's WritePlacer *Plus* Online tool. Based on Vantage Learning's IntelliMetric engine, it uses a rich blend of artificial intelligence (AI) and the digitization of human expertise to accurately score and assess a student's competency in subjects ranging from reading and writing, to science and social studies.

WritePlacer *Plus* Online provides a direct measure of a student's writing skills and is offered as part of the ACCUPLACER Program. With this test, a student writes an essay in response to a specific prompt. WriterPlacer *Plus* Online features electronic scoring, which allows the college staffers to administer a writing assessment using any modern Web-browser-equipped computer connected to the Internet—with no software to load. The student's response is scored electronically using the IntelliMetric System, a platform that utilizes AI to score writing samples and open-ended responses. Scores are returned within seconds, allowing the university to incorporate WritePlacer *Plus* Online scores into branching profiles and placement rules.

"After taking the test, students immediately get a printout that shows them the focus and clarity of their writing," says Greer. "It's really efficient. We are able to bring the students in, test them and have them over to an advisor within minutes. It's one-stop shopping—and a

task that previously took weeks is reduced to an hour."

Because the University of Houston has an open admissions policy, they have very little test data on each student, including few SAT scores. "All we really have is a high school diploma," explains Greer.

Meeting State Requirements

WritePlacer *Plus* Online helps the school's counselors and placement specialists handle students more efficiently and with better understanding of their unique needs. Student writing samples are scored using modified holistic scoring, which evaluates the overall quality of an essay based on focus, development, organization, sentence structure, and mechanical conventions.

"We can use WritePlacer *Plus* Online to fulfill the state-mandated TASP requirement that we test every student to see if they can write a five-paragraph essay," says Greer. The assessment tool also offers a sentence-skill module that provides the information necessary to place the student in either developmental-level or college-level English. It can also be used to assess writing skills again in the junior year.

WritePlacer *Plus* Online is also convenient for students. They can access the test in the university's learning lab or other testing areas, and they can take it at their own convenience.

Mastering Skills

Finally, WritePlacer *Plus* Online helps ensure that every University of Houston graduate enters the business world with solid writing skills. According to Greer, a single course in freshman composition is not enough preparation.

"Many graduates in the past have somehow flown under the radar and simply not addressed their writing-proficiency problems. To me, that's a poor reflection on the university."

With WritePlacer *Plus* Online, Greer and his colleagues can help ensure that each University of Houston student receives appropriate writing instruction at the level they require. This allows them to master the skills necessary to be successful communicators and writers after they graduate.

Greer adds, "When we apply technology that's beneficial to the students, it also makes the university itself look even more professional. We use WritePlacer *Plus* Online exclusively now."

For more information, contact Gary Greer, director of academic counseling, University of Houston, at ***greerg@uhd.edu*** *or* ***(713) 221-8101.***

University of Memphis

Expanding Network Opts for New Switch

The University of Memphis has become one of the largest universities in the southeastern United States. As the campus has expanded, so has its network infrastructure. Managing the growing number of Wintel servers that support production and development-level applications used by various administrative units—increasing from 22 servers only two years ago, to the current 41—presented a challenge to the IT department.

As the university has broadened, so have the school's IT needs in accessing and controlling the growing number of servers on the Wintel platform. According to Robert Jackson, Systems Administrator, University of Memphis, one particularly daunting task was managing different levels of access to servers and network devices for the different user groups. "The old model of having bulky cables for these systems became unmanageable over a period of time. We needed a scalable KVM

[Keyboard Video Mouse] solution that could grow with us," explains Jackson.

Investigating a Solution

Jackson set out to find a switch that would suit their needs of scalability, simultaneous accessibility, and efficiency. He did his homework on KVM vendors, looking through trade magazine ads and from there, posting to user groups, public forums and chat rooms asking users from other universities about their KVM configurations. A number of postings pointed to Raritan Computer Inc. (www.raritan.com) as the ideal solution, explaining that it was expensive but worth the functionality and good, quality equipment.

After about a month of waiting for purchasing approval, Jackson was able to select Raritan's Paragon with Cat5 Simplicity, adding the TeleReach remote access option. Implementation was smooth and simple: Jackson opened the box, plugged everything in, experimented for about two hours, and within one to two days, the servers were configured.

His KVM configuration consists of one Paragon, one TeleReach and two user stations. Jackson has one user station for local console access in the server room and the other one works with the TeleReach unit for remote access.

"The Raritan solution enables us to manage our network devices without having to physically travel to the server

room," explains Jackson. The systems administrators are also able to see the boot-up sequence from their desks, rather than having to be sitting in front of the local console.

Added Benefits

Using TeleReach, Jackson and his team can easily maintain and build their servers because more than one systems administrator can access them at the same time. This was a great feature, as they wanted the ability to have multiple systems administrators access the KVM switches simultaneously. This has reduced the amount of time they spend in the server room, as well as the time it takes to re-configure anything on the server, because they no longer have to wait for one person to finish their work.

In addition, Jackson was able to address his user access issues using Paragon's built-in user authorization schemes. With this tool, he can set the levels and types of access for each user or group of users, regardless of where they are on campus. For added security, Jackson has chosen to give only select users authorization to access the servers remotely via TeleReach.

Full Speed Ahead

As its operations continue to grow in size and complexity, the University of Memphis expects to expand its current KVM configuration, ordering another Paragon to link the products together. Jackson plans to use the Paragon Computer Interface Modules (CIMs), which provide seamless access to any server, independent of the platform or connection. This will enable him to disconnect the server from the KVM switch without rebooting the server to detect the keyboard/mouse.

Jackson has been able to decrease the cables in his racks, while also seeing significant improvements in the efficiency and effectiveness of his IT operations since installing Paragon.

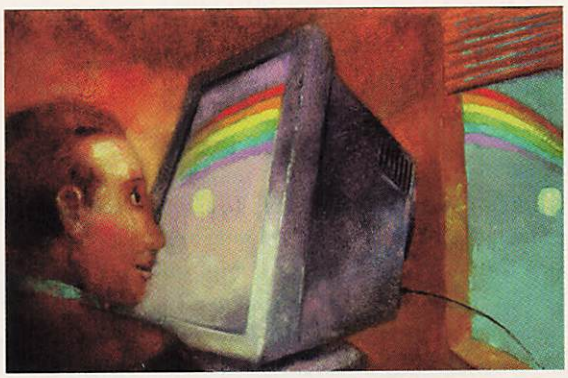
For more information, contact Robert Jackson, Systems Administrator, University of Memphis, at ***rjax@memphis.edu.***

Dakota State University

Technology Equips Graduates with Real-World Experience

John W. Webster

Dakota State University's mission, as authorized by South Dakota legislation, is to integrate information technology (IT) throughout the school's curriculum. Dakota State University is regionally recognized as the leading university for IT education in South Dakota, incorporating technical training within business and liberal arts coursework.



In accordance with this mission, Dakota State University faculty members were looking for new ways to enhance our IT programs. But like many of today's higher education institutions, we grappled with exactly how to integrate new, "real world" enterprise systems into our established business curricula.

Examples of such systems include human resource information systems (HRIS), financials, supply chain management (SCM), and other enterprise solutions. These systems, many of them now Web-based, represent the tools that graduates ultimately will work with in their chosen professions. Students who gain experience in working with these technologies while in college will likely possess marketable skills they can apply in their post-graduation careers.

Fulfilling a Mission

Recognizing the value these technologies lend in the classroom, we began to explore ways to integrate enterprise software theory and training into Dakota State University's College of Business and Information Systems (BIS). Three years ago, we began working with PeopleSoft's On Campus program, and immediately knew it could be the catalyst to help us fulfill our technology mission.

PeopleSoft's On Campus program is a comprehensive industry-academic partnership that helps colleges and universities integrate enterprise software into their course offerings. The program awards training and academic grants of PeopleSoft 8 enterprise management software. Building on an initial project using PeopleSoft's HR and Financials 7.5 modules, PeopleSoft On Campus awarded Dakota State University a $2.8 million grant to upgrade to PeopleSoft 8.

We were the first institution to receive the new, Internet-based software. In the fall of 2001, we began implementing these Internet-enabled products, including PeopleSoft Human Capital Management, Financials, and Supply Chain Management.

Smooth Sailing

Dakota State University worked closely with PeopleSoft to ensure a smooth transition to its new technology-enhanced curriculum. First, we committed to ongoing faculty training on the new enterprise software. Early on, we had contracted with PeopleSoft's educational division to train all BIS faculty in PeopleSoft fundamentals. To date, BIS faculty have attended more than 60 weeks of PeopleSoft functional and technical training, providing us with a unique and outstanding faculty development resource.

To meet the challenge of continuous improvement and development, BIS faculty worked with industry-leading companies to build relevant classroom programs. Our aim is to create programs and courses with real-world technology applications, augmenting curricula with the functional and technical skill sets required in today's workplace.

Today, BIS offers multiple technology-based one- and three-hour courses in enterprise software. The courses cover Internet architecture, application design, installation and the fundamentals of enterprise systems and PeopleSoft. Additionally, Dakota State University is developing an enterprise system software minor in Computer Information Systems.

Sharing the Wealth

Interestingly, Dakota State took its growing partnership with PeopleSoft a step further. A natural extension of our On Campus experience is our institution's new Center for Remote Enterprise System Hosting (CRESH). Through CRESH we offer other interested schools remote-hosted access to PeopleSoft's suite of applications. Institutions around the world are interested in utilizing enterprise systems in their courses, but not every school has the time or technical where-with-all to support complex systems infrastructures. That is where CRESH comes in, and we anticipate that it will be a significant new resource for schools across the United States. At CRESH we have the technical infrastructure in place, and we are developing business models and access and delivery options that schools may wish to utilize (for example, we can connect schools to the PeopleSoft server over Internet2). We highlighted the Center at recent events such as the Information Systems Education Conference (ISEC) and the Decision Sciences Institute (DSI) and received enthusiastic interest from faculty members from around the world. CRESH is how Dakota State can "share the wealth," bringing the merits of the On Campus program to bear on other schools across the country.

"At Dakota State University, we learned first-hand that a successful, enterprise-software implementation—even for academic uses—involves a significant investment of time and resources," says President Jerald A. Tunheim.

"The implementation process—contracting, installation, training, testing, maintenance, and support—is very similar to the implementation cycles of a commercial project. But then we had to add curriculum development to the mix too! With the technical infrastructure completed, we now have a multi-year plan in place that focuses on faculty and curriculum development and the CRESH remote-access initiatives, all of which will allow us to exploit the capabilities of this new enterprise software, while offering an exciting new resource to other institutions around the country."

While extensive and time-intensive, these undertakings are helping Dakota State University keep pace with the most recent technical developments in the industry. The latest pure Internet enterprise software opens doors for remote access to applications and to new styles of teaching and learning. With the use of these technologies, industry and academia collaboration can enrich courses and provide a direct benefit to our students.

For more information contact John Webster, PeopleSoft Programs Director, CRESH, at ***John.Webster@dsu.edu*** *or visit the CRESH Web site at* ***http://cresh.dsu.edu.***

Claremont University Consortium (CUC)

Colleges Collaborate on Shared Administrative Services

Mary A. C. Fallon

More than two years ago, the Claremont University Consortium (CUC) in Claremont, California faced the problem of aging technology unable to weather the information and productivity demands of approximately 6,000 Internet-savvy students and more than 3,360 faculty and staff.

The pending end-of-life for administrative software and hardware systems at the Claremont consortium in Southern California has lead to a partnership that is making access to information and sharing resources simpler for students, faculty, and staff.

The institutions in the consortium—Pomona College, Claremont McKenna College, Harvey Mudd College, Pitzer College, Scripps College, Claremont Graduate University, and the newly formed Keck Graduate Institute of Applied Life Sciences—are distinct from each other in many respects, from academic requirements to campus architecture. The effort to upgrade systems centered on the five undergraduate colleges. Most of them were relying on aging servers and administrative databases that were not greatly integrated into college administration functions, and not linked at all with the other consortium colleges. The consortium remedied its problem while lowering new technology costs by collectively purchasing an estimated $5 million integrated software system from Jenzabar Inc. of Cambridge, Mass.

The system included the Jenzabar Series 300 CX enterprise resource planning (ERP) application to manage the high-end processing work of admissions, registration, degree auditing, student billing, financial aid processing, and development, says Sashi Parthasarathi, Jenzabar's vice president of client services. Sitting on top of Jenzabar's Unix-based Series 300 CX is its Campus Portal, which will enable students to use e-mail, keep track of course assignments and campus activi-

ties, register for classes, and complete other tasks that interact with back-end administration systems. The portal, is a beta version that "knows" whether the user is a student, educator, administrator, or alumnus and presents the appropriate access and information for each role.

At CUC, Jenzabar's products run on a single Hewlett-Packard N4000 server with four 550MHz processors, 8GB of memory, and more than 300GB of disk space running HP-UX 11.0. The new system replaced old 1032-based, flat-file data manipulation systems running on VAX VMS computers.

According to Parthasarathi, CUC's adoption of Jenzabar marked the first time, since the company's merger in 2000 with four software competitors, that it installed student portals integrated with back-end systems. A key advantage of this integration is that students can electronically "cross-register" for courses. This eliminates the old method of walking paper registration forms from one campus registrar's office to another, and it addresses the problem of ensuring that each students' courses and grades get properly credited, explains Richard Parker, chief information officer of Harvey Mudd College. "Students are much happier with the easier registration system."

Although at some levels all the institutions have cooperated and shared services over the years, they have never undertaken an administrative system overhaul of such enormous size and scope. Not only is it changing the type of information that constituents will have access to, it has altered how employees at the registrar, admissions, financial aid, development/alumni affairs, and information technology departments at the various institutions perform the daily tasks of their jobs.

CUC's Administrative Services Improvement Project is overseen by an executive committee of college presidents and CUC executives, a steering committee of college CIOs, and a number of "Tiger Teams" made up of administrative staff to determine policies and decide how technology integration changes how they and their colleagues do the many tasks of their jobs. Jenzabar's project manager Carl Pohrte and his small team spends 100 percent of their work time on the CUC campuses, and will remain until implementation is completed next summer. "The Tiger Teams have been amazingly successful—building strong relationships of trust and open communication that has made things happen," says Pohrte.

When completed next summer, the integration project will mesh 29 databases with 900 tables and 8 computer systems, providing a horizontal database across the consortium—while maintaining the privacy and separate ownership of each institution's individual student records.

For more information, contact Richard Parker, CIO, Harvey Mudd College at ***richard_parker@hmc.edu.***

Trends, *continued from page 8*

These efforts are attempts to foster conversation around the building, as well as the sharing and practical exchange of learning software systems and tools. These are important efforts. While the acronym soup may be challenging, they are communities you need to learn about and find ways with which to engage. We aren't all developers, or architects, or faculty, or K-12 teachers. We may, at times, play some of these roles, however, we are all interested in leveraging our intellectual capital to make technology more useful to teaching and learning.

Finding a Voice

How do we make ourselves heard in the cacophony of dotcoms, dotorgs, and dotnets that are working to create the next generation of learning tools? As the saying goes, think globally, act locally. Here are some suggestions to help you find a voice:

- Seek public forums among your disciplinary societies and professional associations to express your thoughts about learning technologies.
- Participate in the Educause/National Learning Infrastructure Initiative (NLII) virtual communities of practice initiatives that are currently addressing Electronic Portfolio Practices, Learning Objects, Teaching and Learning, and the New Academy.
- Get involved with the IMS Global Learning Initiative (to become a voting member is an institutional commitment but individuals can participate without a membership fee).
- Subscribe to the OKI Announcements list to learn more about their efforts.
- Raise your voice at your own institution that the selection and relevant design of learning tools need your input.
- Participate in the Syllabus community to meet with your colleagues around the educational tools that matter to you.
- Don't acknowledge "no" or silence as an acceptable response to your concerns.

William James, the philosopher and educator, gave a eulogy for his compatriot Robert Gould Shaw on the Boston Commons in 1897. He was speaking to honor not only Shaw but also express what it means to be a citizen in a great nation. His ideas are relevant today in thinking about community involvement in shaping the direction of the world in which we live, including the small part in which we inhabit educating our citizens.

He wrote: "A great nation is not saved by wars. It is saved by acts without external picturesqueness; by speaking, writing, voting reasonably; by smiting corruption swiftly; by good temper between parties; by people knowing true men when they see them, and preferring them as leaders to rapid partisans or empty quacks."

We have an obligation to speak and write reasonably about new models for learning software.

EDUCATOR'S REVIEW

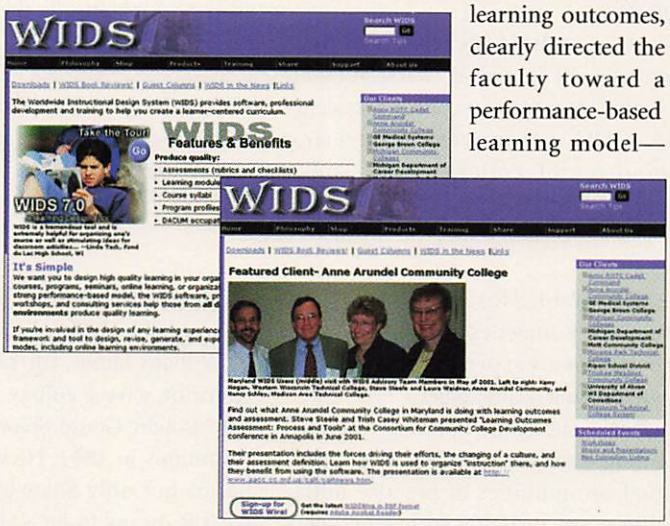
Instructional Design: Easier with WIDS

By Laura Weidner

Anne Arundel Community College, in Arnold, Md., has many excellent instructional staff and faculty and plenty of technology. But we weren't sure how to proceed with revamping the college's developmental reading program.

It was time to change—but how? How do you take two very traditional workbook and worksheet-based developmental reading classes and transform them into a comprehensive program that truly meets the needs of under-prepared students?

Research into best practices, along with one of our mission mandates focusing on learning outcomes, clearly directed the faculty toward a performance-based learning model—



one that specifies learning results in advance of instruction. The WIDS (Worldwide Instructional Design System) model, a comprehensive strategic plan for learning and assessment design, fit our goals.

WIDS offers a set of tools to educators to facilitate competency-based curriculum design. These include a curriculum design model, training, and software. WIDS is a division of the Wisconsin Technical College System Foundation, a 501(c)(3) not-for-profit corporation dedicated to the advancement of vocational, technical, and adult education.

Sometimes it is all too convenient to write a content outline, state a few objectives, identify a textbook, and consider a course developed. Genuine course and program development require a great deal of thought, starting with the end—the outcomes you expect—in mind. WIDS provided a consistent framework and terminology for our curriculum development. It was logical, systematic, and helped us think like experienced instructional designers.

Course and Program Design

The WIDS software served as a tool—not a be all and end all—in our development. The application is a database, and walked us through elements of our course and program design. From the first step—determining what you want the learner to be able to do as a result of the course—through development of specific learning and assessment activities, WIDS helped us think about curriculum and what was being asked of learners. Among the questions raised:

- Who is the learner?
- What do you want the learner to be able to do? *(competency)*
- What supporting skills, knowledge, and processes does the learner need to know in order to do this? *(learning objectives)*
- How will you know when the learner has achieved the competency? *(performance assessment task)*
- How will the learner go about achieving the competency? *(learning activities/ learning plans)*

WIDS software is easily navigable with buttons and menus—truly point and click. The program also provides on-screen, step-by-step directions for every aspect of the process. A verb library is provided, for example, with over 600 verbs classified according to Bloom's Taxonomy. Elements of a course can be linked to other elements, such as a competency to a core ability or external national, state, or professional standard (provided in a Standard Library). Each competency is linked to its associated learning objectives, learning activities, performance assessment tasks, criteria and conditions for success, and standards. This

allows you to create new courses from existing ones, picking and choosing competencies/associated elements from a Competency Bank.

Occupational Analysis

The DACUM (Developing a Curriculum Module) provides over 60 DACUM charts, and allows you to enter your own. Duties and tasks can then be connected with the rest of the curriculum design process.

Reports

As far as output, you can determine what you want included in reports, and how the reports are formatted. A "Course Outcome Summary" is a perfect overview of the course. A "Learning Plan" provides students with the clearest, cleanest, most thorough answer to the perennial question, "Did I miss anything yesterday when I was absent?" A "Performance Assessment Task" shows a student in advance exactly what he or she must do in order to demonstrate mastery—removing subjectivity in grading. A "Syllabus" delineates the course requirements, assignment schedule, instructor and departmental policies, even the ADA statement. Little or no additional input is required to generate these and other customized documents in Microsoft Word and HTML.

Success

Our reading department now has a comprehensive four-course, outcomes-based program.

When a student leaves a course and moves on, the instructor in the next course can be confident that the skills required were learned and mastery has been clearly demonstrated in a measurable way. Part-time instructors have a "standard" course syllabus with well-defined course competencies, linked to our college-wide goals and departmental policies.

All in all, our strategic planning for learning paid off. We continue to meet learning and teaching challenges with the use of WIDS.

Laura Weidner is director of integrated reading and ESL at Anne Arundel Community College in Arnold, Md.

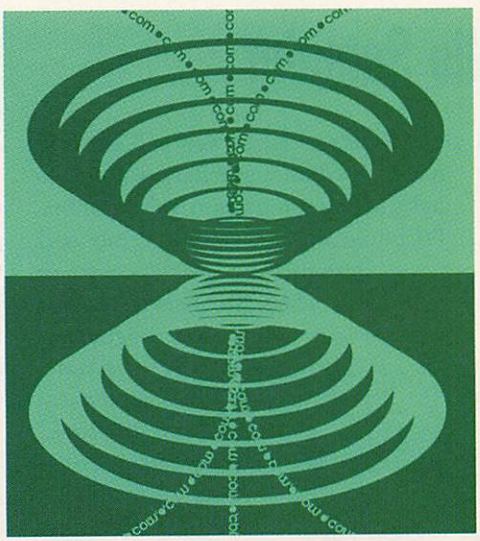
FEATURED PRODUCT

TrueOutcomes Connects Teaching and Assessment

Once upon a time students typed papers on, well, paper, handed them in to teachers, who graded the work, recorded the grades in grade books, and returned the work to the student at the next class. How will teachers grade student work in the electronic age?

A prime candidate for the student assessment tool of the future is the electronic portfolio (ePortfolio). In addition to changing the way instructors grade, ePortfolio offer ways of transforming the raw data of student work into quantified, organized, searchable material. Users can then apply this data to faculty assessment, curriculum development, and accreditation. Or so claim the purveyors of assessment software. Outcomes Assessment Solutions has positioned their product, TrueOutcomes, as one such universal assessment solution.

At its core, TrueOutcomes is a Web database-driven portfolio system. While facilitating assessment, the student-based Professional Portfolio allows students to paint a more complete picture of their accomplishments for graduate school admission or potential employers than traditional test scores and transcripts allow. Similar to other ePortfolio packages, the software contains elements that encourage students to articulate goals and reflect on their work.



The software contains elements that encourage students to articulate goals and reflect on their work.

There are four components of TrueOutcome's Professional Portfolio:

The Comprehensive Portfolio holds electronic copies of all work submitted by the student, including graphics, multimedia, video, and text. Students organize the portfolio by the quality of the work and by the course or extracurricular project for which the work was created. The Showcase Portfolio contains a student's choice of his or her best work. The Self-Interview highlights a student's academic and professional objectives, while the Professional Portfolio contains an Electronic Resume. The content of all the Profes-

sional Portfolio components is password-protected.

For faculty and administrators, TrueOutcomes provides tools designed to have a wider impact on teaching than simply changing how teachers review student work. Outcomes Assessment Solution's faculty and administrator-based components—the Juried Portfolio, the Survey, and the Curriculum Record—are all geared toward transforming the way teachers teach, helping them to "close the loop" between teaching and outcomes.

For the Juried Portfolio, students submit work electronically following the same procedures used in submitting work for the Professional Portfolio. However, all submissions to the Juried portfolio must be certified as the student's own work by the instructor. Work in the Juried Portfolio is given a quantitative score by a team of evaluators using a rubric. Results of the evaluation show a score and comments for each element of the assignment's rubric, a score for each assignment, and an overall portfolio score. Data from the Juried Portfolio reviews is assimilated and charted to summarize the outcomes for an entire institution or department. Clicking on elements in the graph allows the user to navigate between different levels of detail in the data. In this way, teachers and departments have clear, quantifiable evidence about where they are succeeding and where improvement is needed.

The Survey module allows users to gather and analyze other types of information about student, faculty, and alumni experience. An option allows users to configure the product to preserve anonymity. The surveys include both multiple-choice and open-ended questions, which are typically designed to assess areas such as student satisfaction, alumni achievement, and perceptions of academic experiences. Staff and faculty can view graphs and tables of the results. Curricular changes brought about as a result of information uncovered in the surveys can be documented in TrueOutcome's third assessment tool, the Curriculum Record.

The Curriculum Record provides faculty with a format for recording detailed course objectives and desired outcomes so departments can track how well expectations are met and how courses change to better match educational goals.

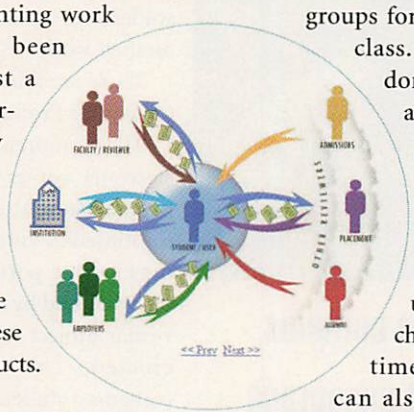
TrueOutcome uses the information from Curriculum Record to generate matrices of courses versus outcomes for each major, along with a chronological report of curriculum changes and why they occurred.

For more information, call (877) 529-1329 or visit www.trueoutcomes.com.

PRODUCT ROUND-UP

An Electronic Portfolio Sampler

The promise of electronic portfolios (ePortfolios) has been a hot topic in some academic circles lately. And while the potential of organizing, assessing, and presenting work on the Web has been explored for almost a decade at some universities, it is only recently that a host of technology vendors have stepped in to meet the demand. This month we'll take a look at some of these new commercial products.



iWebfolio

Nuventive's iWebfolio is designed to help instructors evaluate student work through multiple portfolios created and maintained by the students. Students give faculty access to view and assess all material within a specific portfolio. To help manage portfolio submissions, iWebfolio allows faculty to create user groups for a specific course or class. To ensure students don't alter assignments after the due date, faculty can request students to "lock" their portfolios—once a portfolio is locked, students are unable to make changes for a specified time. Faculty members can also build portfolios.

Institutions can use iWebfolio to create templates that match institutional goals and desired learning outcomes. In addition, they can import portfolios from iWebfolio into Nuventive's assessment software TracDat, which provides a structured framework for continuous quality improvement and assists with external accreditation.

Portfolios are housed on the Nuventive server. The cost is $40 per student per 50MB a year, with no cost to the faculty or administration. Users must use Internet Explorer 5.0 or higher or Netscape 6.0 or higher. Contact: Nuventive, Pittsburgh, Penn.; (877) 968-0156; www.nuventive.com.

Folio

Folio by ePortaro is positioned as a cradle-to-career portfolio tool. Students deposit information into a central repository, the folio. This information comes in two types: documents—word processing, spreadsheet, graphic, or any other computer documents—and standard forms supplied by Folio or by the university for specific purposes, such as assessment or job history. Some of the information may also be provided by

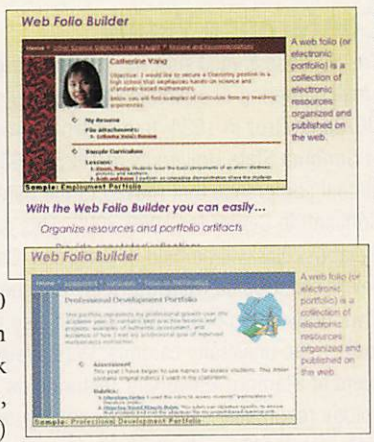
the university and "certified" as being correct, such as the student's GPA. The student then creates different portfolios for purposes using subsets of this data. A student might have three resume portfolios, a specific portfolio for each class, and a portfolio for their rugby team, all using data from the same central source. The student grants access to a portfolio to a person inside the institution by specifying his or her user ID, and to someone outside the institution by specifying an e-mail address. While Folio can be used for the standard purpose of submitting papers to be graded, its focus is on the broader uses of the ePortfolio.

Portfolios are generally housed at the university, though ePortaro also offers hosting services. All access is through Web browsers. The company uses the application software licensing model—it charges the university a one-time licensing fee and annual maintenance fees, both based on volume. Contact: ePortaro, Herndon, Va.; (703) 220-6902; www.eportaro.com.

e-Portfolio

Chalk & Wire's e-Portfolio allows students and faculty without knowledge of Web design to create professional-looking portfolios that showcase their work. Users can choose from among a number of different designs, and can further customize their portfolio with photos from the included image bank. Like other products, e-Portfolio allows users to describe and reflect on their work. The software supports the creation of portfolios around standards such as INTASC or ATE. It also allows users to distribute e-resumes to appropriate readers or employers via e-mail. e-Portfolio can be bundled with Chalk&Wire's separate online assessment tool, RubricMarker, which offers tools to improve the quality of assessment.

Chalk & Wire portfolios may be stored on the institution's or on Chalk & Wire's servers. Users require a Web browser (Mac users also require FTP client software). Base cost is $12.50 to $58.50 per student based on volume. Contact: Chalk & Wire, Ottawa, Ontario, Canada; (877) 252-2201; www.chalkandwire.com.


Web Folio Builder
With the Web Folio Builder you can easily...
Organize resources and portfolio artifacts
Web Folio Builder

FolioLive

FolioLive is textbook publisher McGraw-Hill's entry into the ePortfolio field. Focusing primarily on course-level assessment, FolioLive allows students to create password-protected Web-based portfolios in a few simple steps. Students organize their work using the "Frameworks" provided or can create their own customized design. Students can annotate submissions and can organize work around standards such as INTASC, NBPTS, and ISTE. FolioLive allows instructors to create a course site with links to student portfolios. The course site also contains a mechanism that enables instructors to comment on specific student work.

Portfolios are housed on the McGraw-Hill server and are accessed through a Web browser. Students can subscribe to FolioLive for one year and can renew thereafter. There is no cost to the university. Contact: McGraw-Hill, New York, N.Y.; call your local representative, who can be found by clicking "Rep Locator" at www.mhhe.com or visit www.foliolive.com.

Web Folio Builder

TaskStream has introduced an ePortfolio package geared toward teachers. Teacher candidates can use Web Folio Builder to put together portfolios that can serve a variety of academic and professional functions.

Student teachers can submit work to instructors for assessment and can organize their work to demonstrate fulfillment of state and national standards. In addition, users can add resumes, descriptions of their teaching philosophy, lesson plans, and even videos of student-teaching experience for prospective employers to review. Portfolio contents can be updated and edited by the student at any time. Web Folio Builder is password protected; students share information with university-specified "reviewers," who can then assess the students' work and offer feedback. TaskStream also offers a related product, Web Page Builder, which allows instructors with no knowledge of HTML to publish their own Web sites. It includes templates for class Web pages, newsletters, and dynamic syllabi.

Portfolios are housed on TaskStream servers. As its name suggests, the product is Web-based; users need only a recent version of Internet Explorer or Netscape. Cost is $20 per user per semester or $40 per year, with multi-year discounts, and may be borne by the user or the university. Contact: TaskStream, New York, N.Y.; (800) 311-5656; www.taskstream.com.

Call For Papers

Syllabus2003

Plan to present at Syllabus2003

10th annual education technology conference
Held in California's Santa Clara Valley
July 27-31, 2003

There's still time to propose a session!

Proposal deadline: Extended to January 10, 2003

Conference Venue

The Syllabus annual summer conference grew from a small gathering of education technology professionals at UC-Santa Cruz in 1994, to a series of annual events held at Sonoma State University in 1995-1998, to a major annual conference that moved to the Santa Clara Convention Center for 1999-2002. This coming summer, Syllabus2003 will be held in San Jose, California, at the newly constructed Marriott Hotel, attached to the downtown convention center. But we will also return to our roots—the university campus. We have scheduled a major event at Stanford University, featuring its advanced technology resources, education technology expertise, and high-tech facilities. We are looking forward to a conference that offers the best of both worlds—the comfort of a luxury hotel and the collegiality of a university campus.

Content Areas and Tracks

In three broad tracks, we examine the central themes and key technologies which have become increasingly critical to informed decision makers in higher education.

Track 1 - Emerging Trends and Technology in Education

A look at current and emerging technologies in higher education environments.

- Wireless applications in education
- Handheld devices and PDAs
- Advanced networking applications
- E-books
- Smart buildings and classrooms
- High-end video applications
- Interactive and streaming media
- Visualization, 3D modeling, and virtual reality applications
- Trends in personal computing and communication devices
- New distributed computing applications in education
- Virtual laboratories
- Course management systems
- Portals for admissions and alumni communications

Track 2 - Technology Implementation: IT and Administrative Issues

IT and administrative issues for the higher education enterprise, from strategic planning to implementation and infrastructure for large-scale technology programs.

- Technology infrastructure and IT planning
- Student administration systems
- Professional development and faculty support
- Online distance learning programs and collaboration technologies
- Scalable models for distance and distributed learning
- The globalization of .edu: policies and practices
- Standards and open source
- eCommerce
- Security for campus environments
- Accessibility issues and universal design
- Web search engines and finding tools
- Peer-to-peer networking strategies
- Web publishing for the academy
- Digital libraries: resource aggregtion/distributed collections
- Intellectual property
- Content management systems for .edu

Track 3 - Teaching with Technology

A track for those at the intersection of technology and pedagogy, examining the benefits and issues of integrating technology with teaching.

- Instructional design
- Technology and pedagogy
- Student assessment practices
- Security issues and online testing
- Web-based content resources in education
- Testing your course: standards for Web accessibility
- Going the distance: reaching new student populations
- Managing course size on the Web: success criteria
- Web course development tools
- Web-enhanced teaching environments
- Course development and faculty rewards

Syllabus2003

Syllabus2003 Conference Program Advisory Board

Judith V. Boettcher, CREN
Lois Brooks, Stanford University
Jacqueline Brown, University of Washington
Kathy Christoph, University of Wisconsin-Madison
Phillip D. Long, MIT
William H. Riffee, University of Florida
Frank Tansey, CaliforniaColleges.edu

How To Submit A Proposal

Interested parties are invited to submit proposals via e-mail per the following instructions. All relevant proposals will be considered, so if you have a compelling education technology topic elated to but not specified in the above list, please feel free to submit a proposal.

Syllabus is now accepting proposals for the following session types:

Full- and Half-Day Workshops (3-6 hours)
Classroom style, in-depth workshops that explore the hows and whys of technology implementation along the subject lines of the tracks indicated above.

Breakout Sessions (1-2 hours)
Shorter survey presentations that introduce a technology, program, or pedagogical strategy as well as the issues and benefits of implementation in the higher education environment. Based on the tracks indicated above.

Panel Sessions (1-2 hours)
Plenary sessions with a group of speakers and a moderator brought together for a discussion or debate of topics selected from the conference tracks.

Technology Application Case Studies (45 minutes)
These sessions are focused on practical case studies of technology applications and integration in higher education. This is an opportunity for all those involved in the IT implementation and operations—faculty, administrators, and technologists—to share their experiences with implementation teams from other campuses. These sessions should be issue/results-focused.

Poster Sessions
A detailed look at graphic presentations and papers posted in designated areas. Poster presenters will be onhand for informal discussion at designated session times.

Submission Guidelines

Submissions should include the following information:

I. The title of the presentation

II. The proposed format, e.g., breakout session (see session types, above)

III. An abstract of the presentation content (600 words or less)

IV. An indication of the conference track(s) into which your topic would most likely fall

V. A brief session description suitable for publication (one 75-word paragraph)

VI. Name and academic title (e.g., Ph.D. or Ed.D.) for each presenter

VII. E-mail address and phone number for each presenter

VIII. Presenter bio(s) suitable for publication (one 75-word paragraph each—be sure to include current position and affiliation)

IX. Any further information that might be helpful in determining the relevance of your topic to the conference

The final date for submissions is January 10, 2003 Notification of acceptance will be made by January 15, 2003. Proposals will only be accepted electronically.

Submit your proposal by e-mail:

mgrush@syllabus.com

Please include the following in the subject line (where "lastname" is the presenter's last name):

Syllabus2003 lastname

Speaker Discount: Presenters whose proposals have been accepted for speaking are entitled to receive a "speaker" discount.

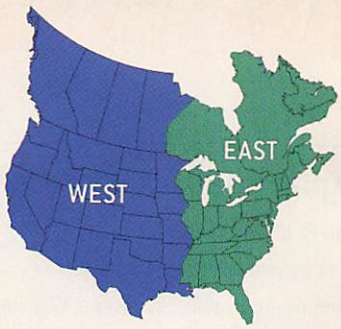
Note: As a condition of acceptance, each presenter will be required to submit, by March 15, 2003, a 1,000- to 1,500-word article for consideration for publication in the conference proceedings, in *Syllabus* magazine, or on the Syllabus Web site.

ADVERTISER INDEX

Our advertisers offer a wealth of information on their products through their Web sites and telephone customer services. Below is a summary of all the advertisers in this issue, where you'll find their ads, and their telephone contacts and Web addresses.

Company	Page	Phone	URL
CDW Government Inc.	7	(888) 239-7282	www.cdwg.com
Connectix Corporation	5	(650) 571-5100	www.connectix.com
Epson America Inc.	C2	(800) GO-EPSON	www.epson.com
Gateway	C4	(888) 888-0795	www.gateway.com
Jenzabar Inc.	21	(877) 536-0222	www.jenzabar.com
WebCT	29	(781) 309-1000	www.webct.com
SMART Technologies Inc.	C3	(888) 42-SMART	www.smarttech.com/syllabus
Sony	9	(800) 472-SONY, ext. PJNET	www.sony.com/pjnet
Syllabus Radio	25	(800) 795-5228	www.syllabus.com
XanEdu	14	(800) 218-5971	www.xanedu.com

This index is provided as a service. The publisher assumes no liability for errors or omissions.



Publisher
Mark Sande
Phone: 818-435-5426
Fax: 818-734-1522
E-mail: msande@101com.com

West
Advertising Director
Tom Hernandez
Phone: 949-265-1561
Fax: 949-265-1528
E-mail: thernandez@syllabus.com

East
Eastern Sales Manager
Mark Weeks
Phone: 732-961-0885
Fax: 732-961-9547
E-mail: mweeks@syllabus.com

Conference Sales Manager
Job Board, Classifieds
Anne Morris
Phone: 818-734-1520 ext. 219
Fax: 818-734-1529
E-mail: amorris@101com.com

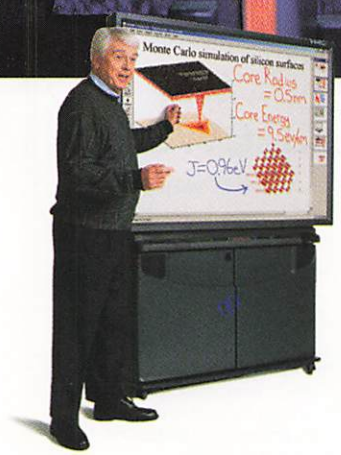
Corporate Headquarters: 9121 Oakdale Ave. Ste. 101, Chatsworth, CA 91311, www.101com.com. **Media Kits:** To request Media Kits, please call 818-435-5440. **Reprints:** For all editorial and advertising reprints of 100 copies or more, and digital (Web-based) reprints, contact Reprint Services at 651-582-3800 or kmandler@reprintservices.com. **List Rentals:** For Syllabus list rentals, or to rent names from 101communications' Master Database, please contact Cathy Dodies at 215-643-8047, cdodies@101com.com or Jane Hope, 215-643-8046, jhope@101com.com. **Conferences:** *SIGS/101 Conferences* and *TechMentor Conferences* contact Al Tiano, Sales Manager, 818-734-1520 ext. 190, atiano@101com.com. *The Data Warehousing Institute* contact Diane Smith, Exhibit Sales, 206-246-5059, ext. 108, dsmith@dw-institute.com; Denelle Hanlon, Publication and Sponsorship Sales, 206-246-5059, ext. 102, dhanlon@dw-institute.com. *FCW Events and Conferences* contact Lucy Cooley, Events Director, 703-876-5081, lcooley@101com.com.

© 2002 by 101communications LLC. All rights reserved. Reproductions in whole or part prohibited except by written permission. Mail requests to Mary Grush, *Syllabus*, 101 First Street, #605, Los Altos, CA 94022. The information in this magazine has not undergone any formal testing by 101communications LLC and is distributed without any warranty expressed or implied. Implementation or use of any information contained herein is the reader's sole responsibility. While the information has been reviewed for accuracy, there is no guarantee that the same or similar results may be achieved in all environments. Technical inaccuracies may result from printing errors, new developments in the industry and/or changes or enhancements to either hardware or software components. We assume no liability for unsolicited materials. Mention of products and services is for informational purposes only and constitutes neither a recommendation nor an endorsem ent by the publisher. Syllabus Press®, Syllabus®, SyllabusWeb, and the Syllabus logo are registered trademarks of 101communications LLC. All other trademarks mentioned belong to their respective owners.

Syllabus (ISSN 1089-5914) is published monthly by 101communications LLC, 9121 Oakdale Avenue, Ste. 101, Chatsworth, CA 91311. Periodicals postage paid at Chatsworth, CA, and additional mailing offices. Subscription rates: $24/year United States and Canada, $75/year International. **Subscription Inquiries, back issues requests and address changes:** Mail to: *Syllabus*, 2104 Harvell Circle, Bellevue, NE 68005 or call 866-293-3194 for U.S. and Canada, 402-293-6851 for International, fax 402-293-0741, or e-mail SYL@bellevue.com. Canada Post International Publication Mail (Canadian Distribution Sales Agreement #IPM40039410). **POSTMASTER:** Send address changes to *Syllabus*, 2104 Harvell Circle, Bellevue, NE 68005. Printed in U.S.A.

101communications

CHAIRMAN CURT HESSLER
PRESIDENT & CEO JEFFREY S. KLEIN
EXECUTIVE VP STEVEN CROFTS
EXECUTIVE VP GORDON HAIGHT
SENIOR VP & CFO STUART K. COPPENS
SENIOR VP, CIO, AND GENERAL COUNSEL SHERYL L. KATZ
SENIOR VP, OPERATIONS BRADFORD C. STAUFFER
SENIOR VP, HUMAN RESOURCES MICHAEL J. VALENTI



Today's students have higher standards for higher education. They invest their time and tuition in schools that offer the latest in learning. With interactive whiteboards and lecterns, whiteboard cameras and multimedia cabinets, SMART can help you create the collaborative classrooms that are in demand. Because your students have admission standards too.

Visit www.smarttech.com/syllabus to receive more information.

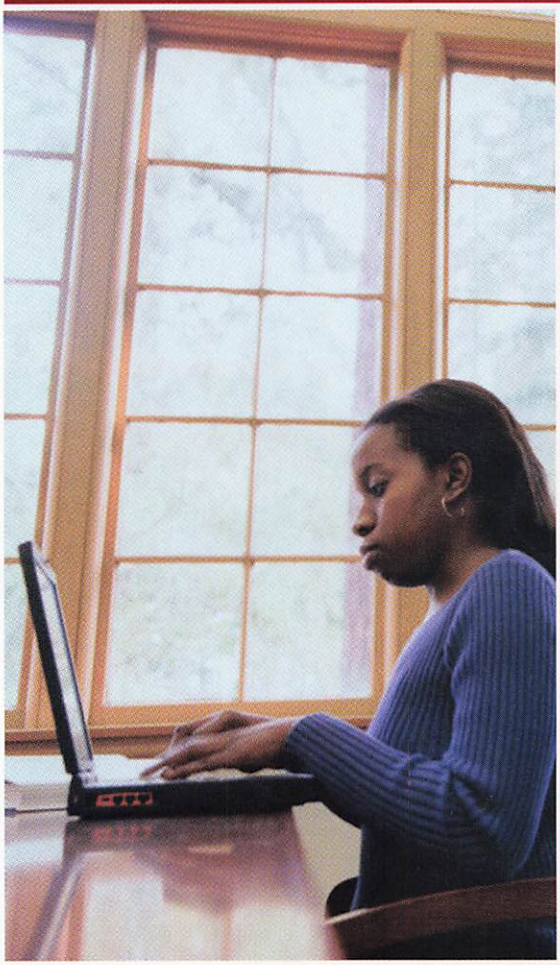
SMARTer Kids Foundation

SMART Technologies Inc.

© 2002 SMART Technologies Inc. All rights reserved. The SMART logo is a trademark of SMART Technologies Inc. SMARTer Kids and the SMARTer Kids Foundation logotype are trademarks of the SMARTer Kids Foundation of Canada.

You can't put a price on the importance of education.

Maybe that's why we've made our network consultation free.



Prices starting at $999

There's no easier, more cost-effective way to provide technology access to more of your students in more locations than with wireless networking. And there has never been a better opportunity to get a wireless network than now, at Gateway. Because we'll come to your school and help with all the planning, hardware selection, installation and network setup you need for your wireless network—all for free.[1] To learn more about the additional benefits of wireless networking and for your free consultation, call Gateway today.

Gateway is proud to team up with NAFEO to help make technology more affordable for students across the nation. We offer special pricing for NAFEO members, rebates for NAFEO-affiliated schools and special discounts for faculty and alumni. Gateway is especially committed to making technology affordable at HBCUs. Call for more details.

Gateway recommends Microsoft® Windows® XP Professional for Education.

The National Association for Equal Opportunity in Higher Education
"KEEPING THE DOORS OF OPPORTUNITY OPEN"

888-888-0795 | www.gateway.com |

Gateway™
A better way.℠

Prices and configurations subject to change without notice or obligation. Prices exclude shipping and handling and taxes. Not responsible for typographical errors. [1]Free consultation based on up to two hours of assessment. Consultation will be provided via phone or on-site, as deemed necessary by the service provider. The specific services delivered during the consultation will be determined by the service provider. Copyright ©2003 Gateway, Inc. All rights reserved. Gateway Terms and Conditions of Sale apply. Gateway.com and Gateway Country Stores, LLC, are separate legal entities. Gateway, the Spotted G Gateway Logo, the Spotted G Logo, the Black-and-White Spot Design and "A better way." are trademarks or registered trademarks of Gateway, Inc. in the U.S. and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. Ad Code: 111928